

Section SF 1449 - CONTINUATION SHEET

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001		1	Lump Sum		

Provide installation engineering, manufacture, test, and deliver one Static Frequency Control (SFC) System for Units 5-8, 12 MW, with exciter tie-in.
(Part 4, Section 16155, Paragraph 2.3)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0002		4	Each		

Provide installation engineering, manufacture, test, and deliver Input and Output Transformers, 15kV dry-type (assume two 6 MVA in parallel for input and output).
(Part 4, Section 16155, Paragraph 2.4)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003		3	Each		

Provide installation engineering, manufacture, test, and deliver Input and Output Circuit Breakers, SF6 drawout, 15kV, 1200A, 25kA (two input, one output)
(Part 4, Section 16155, Paragraph 2.5)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0004		2	Each		

Provide installation engineering, manufacture, test, and deliver Current-Limiting Reactors, 15kV, 700A, 0.25 ohm (two 3-phase banks).
(Part 4, Section 16155, Paragraph 2.6)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0005		1	Lot		

Provide installation engineering, manufacture, test, and deliver Isolated-Phase Bus, 15kV, 1200A, 240LF, with six T-taps and 12 elbows.
(Part 4, Section 16155, Paragraph 2.7)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0006		1	Lump Sum		

Perform Special Factory Testing (SFC, transformers, circuitbreakers, reactors, isophase bus).
(Part 4, Section 16155, Paragraphs 3.1.2, 3.2.1, 3.3.7, 3.4, and 3.5)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0007		1	Each		

Perform Field Test (Static Frequency Control System and Input and Output Circuit Breakers).
(Part 4, Section 16155, Paragraphs 3.1.3 and 3.3.9)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0008		1	Lump Sum		

Accessories (wrenches, tools, special equipment - SFC and Input/Output Circuit Breakers). (Part 4, Section 16155, Paragraph 2.3.15 and 2.5.16)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0009		1	Lump Sum		

Spare Parts (SFC and Input/Output Circuit Breakers).
(Part 4, Section 16155, Paragraphs 2.3.13 and 2.5.17)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0010		1	Lump Sum		

Training of Government Personnel in operation and maintenance of SFC System and equipment.
(Part 4, Section 16155, Paragraphs 3.3.12 and 3.6)

ITEM NO	SUPPLIES/SERVICES	ESTIMATED QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011		30	Days	_____	_____

Services of Erection Engineer during installation of the Static Start System. (SFC, Input/Output Circuit Breakers, Isophase Bus).
(Part 1, Paragraph 19.0)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0012		1	Lump Sum	_____	_____

Travel Costs/Per Diem for Erection Engineer
(Part 1, Paragraph 19.0). The total for this Line
Item is estimated. Contractor will be reimbursed
for actual expenses in accordance with the
Government Joint Travel Regulations (JTR).

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0013		1	Lump Sum	_____	_____

Off-Loading at the Project Site to Powerhouse
(Part 4, Section 16155, Paragraph 1.1.1.)

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0014	Bid Data - Bid Data List Exhibit A - NSP (No Separately Priced)				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0015	Contract Data - Contract Data List Exhibit B - NSP (Not Separately Priced)				

TOTAL: _____

RICHARD B. RUSSELL PROJECT
STATIC START SYSTEM
DESCRIPTION/SPECS/WORK STATEMENT
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PART 1
GENERAL

1.1 DESCRIPTION OF WORK

1.1.1 General

One static frequency control system shall be manufactured, shop tested, prepared and loaded for shipment, delivered f.o.b. destination, off-loaded into the powerhouse, field tested, and made ready for commercial operation as described in the Schedule, together with all accessories and spare parts specified herein. Installation of the SFC will be by others. Training courses shall also be provided for The Richard B. Russell powerhouse personnel, as described in the specifications.

1.1.2 Location of Work Area

The Richard B. Russell Powerhouse is located at 4144 Russell Dam Drive, Elberton, Georgia 30635.

1.2 SPECIFICATIONS

Technical specifications listed below cover the detailed requirements for the equipment and services listed in the Schedule:

<u>SECTION</u>	<u>TITLE</u>
01090	SOURCE OF REFERENCED PUBLICATIONS
01270	MEASUREMENT AND PAYMENT
16155	STATIC START SYSTEM

1.3 CHANGES IN SPECIFICATIONS AND DRAWINGS

The Government reserves the right to revise or amend the specifications and/or drawings prior to the date set for opening. Copies of such amendments will be furnished to all prospective bidders. If the revisions and amendments require material changes in quantities or prices bid, or both, the date set for opening bids may be extended to enable bidders the opportunity to revise their technical proposals and/or bids. The amendment will include an announcement of the new date for opening bids.

1.4 DEFINITIONS

1.4.1 Directed, Required, Ordered, Designated, Prescribed

Wherever in the specifications or upon the drawings the words "directed," "required," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the "direction," "requirement," "order," "designation," or "prescription" of the Contracting Officer is intended and similarly the words "approved," "acceptable," "satisfactory," or words of like import shall mean "approved by," or "acceptable to," or "satisfactory to" the Contracting Officer unless otherwise expressly stated.

1.4.2 As Shown, As Indicated, As Detailed

Where "as shown," "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provided complete in-place," that is "furnished and installed."

1.4.3 Contracting Officer (CO), Contracting Officer's Representative (COR)

Wherever in these specifications or upon the drawings the words "Contracting Officer" (CO) or "Contracting Officer's Representative" (COR), are used, it shall be understood to also mean "Government" unless otherwise expressly stated.

1.4.4 Government Quality Assurance Representative (GQAR)

Wherever in these specifications the word "GQAR" is used, it shall be understood to mean "Government Quality Assurance Representative," unless otherwise stated.

1.4.5 Weekend(s)

Wherever in these specifications the word "weekend(s)" is used, it shall be understood to mean "Saturday, Sunday and Federal Holidays," unless otherwise expressly stated.

1.4.6 Project

Wherever in these specifications the word "Project" is used, it shall be understood to mean "Richard B. Russell Project".

2.0 CONTRACT DRAWINGS

2.1 The work shall conform to the following contract drawings listed on drawing RR-105 Plate G-1 RICHARD B. RUSSELL PROJECT STATIC START SYSTEM

2.2 Five sets of contract-size drawings and the specifications will be furnished without charge. Additional sets will be furnished upon request at the cost of reproduction.

3.0 CONTRACTOR'S DRAWINGS AND DATA

3.1 Within 45 calendar days after date of receipt of signed contract, outline drawings and mounting details of all equipment to be furnished under this contract shall be submitted for approval together with weights and overall dimensions. These drawings shall include the over-all dimensions of the assembled static frequency controller and the input/output transformers, locations and sizes of major features, or other major components or subassemblies, recommended electrical clearances from energized parts, any other required clearances, and information as to sizes and weights of largest pieces to be unloaded.

3.2 Within 60 calendar days after date of receipt of signed contract, such assembly and detailed drawings and descriptive cuts and data as are required to demonstrate fully that all parts of the equipment will conform to the requirements and intent of the specifications shall be submitted for approval and show the arrangement and operation of the equipment. These drawings shall include dimensions of bushings and terminals, details of static frequency controller and the input/output transformers, electrical schematic and wiring

diagrams showing locations and connections of components, terminal block and conductor designations, and diagrams of miscellaneous devices.

3.3 All drawings and data submitted and approved will form a part of the contract. The sequence of submission of drawings shall be such that all information is available for checking each drawing when it is received. Any manufacturing work performed prior to the approval of drawings will be at the Contractor's risk. The Contractor shall make any changes in the design which are necessary to make the equipment conform to the provisions and intent of these specifications without additional cost to the Government. Review whether superficial or thorough, and approval of the drawings, shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory. Approval of the Contractor's drawings shall not be held to relieve the Contractor of any part of the Contractor's obligation to meet all of the requirements of these specifications or of the responsibility for the correctness of the Contractor's drawings.

3.4 Three black and white copies of each drawing for approval shall be submitted. The contract drawing title and number, contract number and Contractor's job number shall be shown in the lower right-hand corner of each drawing. Each submission of drawings must be accompanied by transmittal Form 4025 containing a list of drawings giving titles and numbers. Transmittals shall be addressed to U.S. Army Corps of Engineers, Portland District, ATTN: CENWP-HDC-A, P.O. Box 2946, Portland, Oregon 97208-2946, and to U.S. Army Corps of Engineers, Savannah District, Russell Area Office ATTN: CESAS-CD-RR, 2167 Engineer Drive, Elberton, GA 30365. Action on these drawings will be in accordance with the instructions of the reverse side of ENG Form 4025.

3.5 The Government will return one copy of each item submitted within 30 calendar days after receipt and retain the remaining copies. An A, B, or C Action Code will authorize the Contractor to proceed with the fabrication of the equipment covered by such drawings, subject to the corrections, if any, indicated thereon or described in the letter of transmittal. Required revisions shall be resubmitted by the same procedure as previously described. Every revision made during the life of the contract shall be shown by number, date, and subject in a revision block and a notation shall be made in the drawing margin to permit rapid location of the revision. The time consumed in submitting and obtaining approval of assembly and shop drawings shall be included in the time allowed for completion of the contract.

3.6 Upon receipt of prints which have Action Codes C, D, or E the Contractor shall within 30 calendar days after receipt, submit a correct reproducible and two prints of each drawing to the addresses in paragraph 3.4. If revisions are made after a drawing has been assigned an A or B code, the Contractor shall furnish a corrected reproducible and two prints subsequent to each revision.

3.7 No manufacturing work shall be performed prior to the approval of drawings. Approval of the drawings shall not be construed as a complete check, but will indicate only that the general method of construction and detailing is satisfactory. Approval of such drawings will not relieve the contractor of responsibility for any error which may exist, as the Contractor shall be responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work.

3.8 Other Submittals. All of the applicable requirements of this paragraph with reference to drawing submittals shall apply equally to catalog cuts, illustrations, printed specifications, weld qualifications, mill tests, factory tests, field tests, or other required data except that two additional

copies shall be submitted in lieu of any reproducibles. Any such material containing other information not relevant to this contract shall be clearly marked to indicate the areas for which approval is requested. All copies of such material shall be thoroughly legible and capable of legible reproduction, at least in the areas relevant to the items provided under this contract. All correspondence, drawings, literature, instruction books, data, and nameplates shall be in the English language, with English units as currently used in the United States.

3.9 Upon completion of the work under this contract, the Contractor shall furnish to the addresses shown in Part 1, Paragraph 3.4, a complete set of process tracings of all drawings as finally approved. The process tracings shall be full-size reproducibles made on cloth, Mylar, or equal, from the original tracings by photographic-type reproduction, and shall be of such quality and clarity as to permit sharp and thoroughly legible microfilm copying. The tracings shall show all changes and revisions, including any field changes made up to the time that the equipment is completed and accepted and the contract number shall be shown thereon. The number shall be located immediately above the title block if possible.

4.0 Contractor's Electronic Drawing Files. Upon completion of the work under this contract, the Contractor shall furnish to the addresses shown in Part 1, Paragraph 3.4, floppy disks containing all drawings as finally approved. The disks shall be either 3.5 inches or 5.25 inches and shall be in Intergraph MicroStation Version J format. The format compatibility must include, but not be limited to 63 level assignments, color tables capable of supporting 256 colors, and be capable of supporting 20 fonts. The Government will furnish a floppy disk containing the cell and font libraries, and the standard drawing border. These electronic files and the attached level schedule establish the required minimum drawing format.

5.0 Operation and Maintenance Data

5.1 Submittal Requirements. Complete operating and maintenance instructions and parts catalogs shall be furnished for all mechanical and electrical equipment furnished under this contract. Initial submittal of three (3) complete draft copies of the above mentioned material shall be made not less than 60 days prior to delivery of the equipment. Submittal shall be made in accordance with all applicable procedures for submittal of drawings, except as provided herein. One (1) draft copy with appropriate approval of, or comment on, the acceptability of the submittal will be returned. The one (1) draft copy with such corrected and/or additional data sheets and drawings as may be directed shall be resubmitted. Two (2) copies of each data sheet and drawing shall be submitted also for the two draft copies retained by the Government. Upon final approval of the draft, three (3) additional copies shall be submitted for a total of six (6). The copies shall be submitted no later than the date specified for delivery of the equipment.

5.2 General. Binders shall be side binding, telescoping post, expandable back, and shall have a supported vinyl cover with a stiff binder board for 8½- by 11-inch sheets, as manufactured by McBee or approved equal. Ring type loose leaf binders will not be acceptable. Any drawings bound with the material shall be no greater than 11- by 17-inch copies of each shall be furnished. These shall be folded and bound for easy unfolding after being inserted in the binders.

5.3 Parts Catalogs. Parts catalogs shall be suitable for ordering replacements and shall include the part identification, nomenclature, part numbers, required number of parts, and actual spare parts supplied. The listings of spare parts supplied shall include ordering units and unit prices

current at the time of equipment delivery. All data shall match the actual equipment furnished, and standard catalog sheets, cuts, and diagrams shall have all irrelevant parts marked out. Parts shall be so identified that they can be readily ordered from local area industrial supply outlets if not of special manufacture. Assembled material shall include identification of spare parts furnished in compliance with requirements of these specifications as well as recommended additional spare parts to stock for the quantity of circuit breakers provided. A cross reference between items described in catalogs and instructions and drawings shall be provided to facilitate ease in location of parts described.

5.4 Operation Data. The operation data shall include specific operating instructions, functional description of operating parts, and special precautions or procedures to be considered. The Contractor shall be responsible for the necessary coordination between its subcontractors, suppliers, and manufacturers to assure complete submittals on individual interrelated equipment components.

5.5 Maintenance Data. The maintenance data shall include lubrication instructions; instructions for dismantling, assembling, repairing, adjusting, and troubleshooting all mechanical and electrical equipment; parts catalogs; elementary and connection diagrams; control and interlock system diagrams; and a list of special tools required. Lubrication instructions shall be for the service intended and shall include charts or tables indicating items to be lubricated, recommended frequencies, and grade and type of lubricant to be used in accordance with AGMA, NLGI, SAE, Federal or Military Specifications as applicable. Instructions for dismantling, assembling, repairing, testing, and adjusting shall include recommended clearances, bolt torques, temperature and pressure setting, voltages, currents and any other items needed for maintenance of the equipment. The troubleshooting procedures for the electrical equipment shall include step by step diagnostic procedures (both a written description and a flow chart type or arrangement) for each function performed.

5.6 Preventive Maintenance (PM) Charts. Preventive maintenance charts shall be developed and provided in the manual. These charts shall be inserted in an appendix at the end of the manual. This appendix shall be for PM charts only. Preventive Maintenance shall include inspection, testing, cleaning, replacement, and all routine maintenance work. These charts shall include the following:

(1) Subject. A clear and descriptive name for the equipment requiring PM shall be given. References to shop drawings and catalog cuts shall be provided in a clear manner. "Checkpoints" shall be defined for each piece of equipment.

(2) Procedure. A detailed procedural description of the method in which to perform PM shall be provided for all equipment requiring PM work. Safety precautions shall be provided. Descriptions of "checkpoints" shall be provided.

(3) Dates. The PM charts shall include recommended PM dates for a period of ten years following completion of the contract. The dates shall be defined as requiring PM either daily, weekly, monthly, quarterly, semi-annually, or annually.

6.0 BILL OF MATERIALS

One reproducible and two prints of a bill of materials listing each item necessary to complete each major equipment assembly shall be furnished at least 30 days prior to the first delivery of the equipment. This is in addition to the materials schedules required and any list of materials shown on the drawings. This bill of materials shall be complete enough to check each item by quantity, size, and other description as required to assure all material required under the contract has been delivered.

7.0 PURCHASE ORDERS

Two copies of all purchase orders for other than stock materials showing the firm(s) name and address and lists of material shall be submitted as soon as issued, and immediate notice shall be given of the receipt of any material for the work together with detailed lists of same. Orders shall be so worded and marked that each item may be identified in the plans for the work.

8.0 PHOTOGRAPHS

Photographs of each major manufacturing process for the circuit breakers shall be taken, and four prints of each photograph shall be submitted. Photographs shall be 8 x 10 inches in size, including polypropylene protective jacket. Views taken with the 8-inch side vertical shall have the title at the bottom 10-inch side and binding tab at the top; views taken with 10-inch side vertical shall have the title at the bottom 8-inch side and the binding tab at the 10-inch side at the left.

9.0 TIME OF DELIVERY

a. The work shall be commenced under this contract within 10 calendar days after date of receipt of signed contract and delivery of all material and equipment specified herein in accordance with the following schedule:

b. Richard B. Russell Project one static frequency control system complete, including all accessories and approved as-built drawings, spare parts, and approved O&M manuals within 270 calendar days after date of receipt of signed contract.

c. Final tracings shall be delivered no later than 30 days after final examination and acceptance of the equipment. Final acceptance will take place after installation of the equipment.

10.0 PLACE OF DELIVERY

Equipment and materials supplied under this contract shall be delivered f.o.b. transport truck at Project Office. The contractor shall be responsible for the cost of all loading and off-loading activities from any port-of-entry, if applicable, and at the RBR Powerhouse or other designated site at the RBR Project.

Richard B. Russell Powerplant Project
4144 Russell Dam Drive
Elberton, Georgia 30635

11.0 SITE OF ERECTION AND INSTALLATION

Installation to be done by others.

12.0 TRANSPORTATION FACILITIES

The Richard B. Russell Powerplant may be reached by Highway 72, to Bobby Brown State Park Road, to Russell Dam Drive. The powerhouse access road is located on Russell Dam Drive, off Bobby Brown State Park Road. The contractor shall be responsible for verifying that his transportation method complies with all applicable regulations.

13.0 QUALIFICATIONS

Each bidder shall state in its bid whether they are now or ever have been engaged on any contract or other work similar to that proposed, giving the location and rating of the equipment and the year in which it was manufactured or installed. They shall also submit a complete listing of all contracts within the last 5 years for static frequency control systems supplied for generators rated 10 MVA or greater and any other information as will tend to show their ability to do the work required by these specifications. A minimum of five years of previous manufacturing experience and present manufacturing and testing facilities will be considered in determining whether the bidder is qualified to perform the work. A prospective contractor must have the necessary capital and experience, and own, control by firm option, or can procure the necessary plant to commence the work at the time prescribed in the specifications and thereafter to prosecute and complete the work within the time specified; and they must not be already obligated for the performance of other work which would delay the commencement or completion of the work contemplated under this Solicitation.

14.0 REQUIREMENTS FOR DESCRIPTIVE LITERATURE

In accordance with FAR 52.214-21, the following information and descriptive data shall be submitted with the bid package. Descriptive literature shall demonstrate that the proposed equipment complies fully with these plans and specifications. Failure of the bidder to submit complete descriptive literature or submittal of literature that does not fully comply with the specifications may result in rejection of the bid as non-responsive.

a. General drawings, photographs, cuts, descriptive bulletins, and catalog data sheets as required to show the overall dimensions, weight, and general construction of the equipment proposed.

b. Operation and Maintenance Manual. Provide a sample table of contents and outline of an operation and maintenance manual for a static frequency control system similar to the one proposed under this solicitation. Also provide two or three typical chapters with referenced drawings. Information shall be complete enough to determine expected clarity and usefulness of manual for troubleshooting and ordering replacement parts.

c. Self Diagnostic Capability. Provide information describing the ability of the system to monitor the function of its circuitry and to announce or log malfunctions.

d. Maintenance Accessibility. Provide layout drawings, photographs, and details of a static frequency control system similar to the one proposed under this solicitation, to show ease of access for efficient and safe maintenance.

e. Communication Interface. Specify the type of interface to be used and the features of the interface.

15.0 PACKAGING AND MARKING

15.1 PROTECTION OF MATERIAL AND WORK

At all times prior to delivery and as also specified in paragraph D-2, all materials, supplies, and equipment of every description including property which may be Government-owned and all work performed shall be protected and preserved. All reasonable requests from work performed shall be protected and preserved. All reasonable requests from the Government to enclose or specially protect such property shall be complied with. If, as determined, material, equipment, supplies, and work performed are not adequately protected, such property may be protected by the Government and the cost thereof may be charged to the Contractor or deducted from any payment due. All machinery, materials, and articles in a complete or incomplete state for which progress payment has been made prior to delivery shall be adequately protected from loss and from corrosion and all other forms of damage.

15.2 PACKAGING, MARKING AND SHIPMENT

15.2.1 The Contractor shall prepare and load all material and articles for shipment in such a manner as to protect them from damage in transit, and shall be responsible for and make good any and all damage until the equipment is delivered to the Government at the specified delivery point. Where necessary, heavy parts or machines shall be mounted on skids or shall be crated, and any articles or materials that might otherwise be lost shall be boxed or wired in bundles and plainly marked for identification. All parts exceeding two hundred (200) pounds gross weight shall be prepared for shipment so that slings for handling by the crane may be readily attached while the parts are on the car or transport truck. Boxed parts, where it is unsafe to attach slings to the box, shall be packed with slings attached to the part, the slings to project through the box or crate so that attachment to the hoisting equipment can be readily made. Packaging designed for fork lifting shall have any areas where lifting forks should not be placed clearly identified.

15.2.2 No material or equipment shall be shipped until after it has been inspected and accepted for shipment by the Contracting Officer's Representative (COR), or unless inspection of the equipment has been waived in writing.

15.2.3 The Government will accept delivery of materials and equipment when delivered by the Contractor at the specified delivery point between the hours of 0730 and 1400 hours, Monday through Friday. The Contractor shall notify the COR at least 15 days in advance as to the expected delivery dates of the equipment.

15.2.4 All accessories and spare parts shall be packed separately in containers plainly marked: ACCESSORIES ONLY, or SPARE PARTS ONLY. All packing material shall be fire retardant. A packing list, listing the contents of each container, shall be placed in a moisture-proof envelope securely fastened to the outside of the container. The packing list shall provide the following information for each spare part or accessory in the container:

- (1) Manufacturer.
- (2) Contract number.
- (3) Identification, including the manufacturer's drawing number reference.

Each spare part or accessory shall be identified so that it can be easily matched against its entry on the packing list.

15.2.5 As soon as each shipment is made, the Contractor shall furnish to the COR shipping notices on which shall be shown, in addition to the usual data, a description of the article furnished, the item number of the contract schedule to which the article applies, the shipping weight of each item, the number of pieces, the total weight, and if shipped by railroad carload lots, the car number.

16.0 COMBINED PRODUCTION SCHEDULE AND PROGRESS CHART

Within 45 days after receipt of signed contract, six (6) copies of a practicable schedule shall be submitted for approval showing the order in which the work is proposed to be carried out; the dates on which the several salient features will be started [including engineering, procurement of materials, fabrication, factory assembly, and test; cost breakdown (see MEASUREMENT AND PAYMENT)]; and contemplated dates of completion and shipment. The schedule shall be in the form of a bar graph of suitable scale to indicate appropriately the percentage of work scheduled for completion at any time on the salient features as well as the total contract. The actual progress shall be entered on the graph at the end of each month, and five (5) copies of the updated graph shall be submitted monthly.

17.0 INSPECTION AND ACCEPTANCE

17.1 SUPPLY QUALITY MANAGEMENT, CONTRACTOR QUALITY CONTROL (1991 JAN)

The work will be conducted under the general direction of the Government and is subject to inspection by the Government Quality Assurance Representative (GQAR) to ensure strict compliance with the terms of the contract. The Government shall be kept informed as to the general progress of the work and be notified when any item of equipment or component part thereof is ready for testing including testing at subcontractor's plants. No GQAR is authorized to change any provisions of the specifications without written authorization of the Contracting Officer nor shall the presence of the GQAR relieve the Contractor from any requirements of the Contract. Within 90 calendar days after date of receipt of notice of award, a description of the proposed inspection system shall be submitted. The description shall include as a minimum the specific inspections and tests the Contractor proposes to perform to substantiate that the supplies and equipment used in the manufacture of the items to be furnished will conform to the specifications. These tests shall be in addition to those specified in the Technical Specifications requiring submittal of the certified test reports.

17.2 FINAL EXAMINATION AND ACCEPTANCE

When all the work for the equipment specified under this contract has been completed and the equipment has successfully met the requirements of the factory and field tests, and has been satisfactorily installed by others under the expertise and guidance of the erecting engineer the Government will make a thorough examination of the equipment and if it is found to comply with the requirements of the contract, it will be accepted and the Contractor so notified

17.3 FAILURE TO MEET PERFORMANCE GUARANTEES

17.3.1 Should the factory or field tests or operation of the equipment prior to acceptance show that it does not meet the guarantees of the specifications, the COR may reject the equipment or may direct the Contractor to proceed at once to make alterations or to furnish new parts as may be necessary to meet the requirements. All expense of furnishing and installing new parts, or making alterations to existing parts, and of tests made necessary by failure

of the equipment to meet the guarantees or other requirements of the specifications shall be borne by the Contractor.

17.3.2 If, after due notice, the Contractor should refuse or persistently neglect to correct any defects, errors, omissions, or any other failure of the equipment to meet the requirements of the specifications, the Government may proceed at its own expense to correct such defects, errors, omissions, or failures and if the Contractor, upon demand, refuses to make payment of an amount equal to the actual expense so incurred, the Government will proceed to deduct the amount due from any payment or monies due the Contractor

17.4 RIGHT TO OPERATE UNSATISFACTORY EQUIPMENT

The Government shall have the right to operate any and all equipment as soon as and as long as it is in operating condition whether or not such equipment has been accepted as complete and satisfactory, except that this shall not be construed to permit operation of any equipment which may be materially damaged by such operation before any required alterations or repairs have been made. All repairs or alterations required of the Contractor shall be made at such times as directed. The repairs or alterations shall be made in such manner and at such time as will cause the minimum interruption in the use of the equipment by the Government.

18.0 METHOD OF PAYMENT

a. Subject to FAR 52.212-4(i), and all the provisions set forth below, payments to the Contractor will be made monthly or at such other times as may be mutually agreed to on estimates of work performed under this contract and not included in any prior estimate. In preparing estimates, the machinery, material, and articles which have been purchased, paid for, and received by the Contractor and which are to be incorporated into the completed equipment will be taken into consideration. Estimates of work will be by items as numbered and described in Schedule of Supplies/Services of the contract.

b. The contractor shall submit invoices to the designated Contracting Officer's Representative (COR) at the project site.

18.1 MEASUREMENT AND PAYMENT

In addition to paragraph "METHOD OF PAYMENT," payment will be made pursuant to Section 01270, MEASUREMENT AND PAYMENT.

18.2 PAYMENT INFORMATION:

Submit invoices to the following address:

U.S. Army Corps of Engineers
Attn: Mr. Tom List, CESAS-CD-RR
2167 Engineers Drive
Elberton, GA 30635-9245

Payments will be made by the following agency:

U.S. Army Corps of Engineers Finance Center
CEFC-AO-P
7800 Third Avenue
Millington, TN 38054-8001

19.0 SERVICES AND PAYMENT OF ERECTING ENGINEER

19.1 The contractor shall provide an erecting engineer. The engineer shall be furnished at the unit price stated in the Schedule under Bid Item No. 0011, shall be fluent in spoken and written English language, and shall be responsible for the correctness of the instructions given the erecting Contractor. The erecting engineer shall be employed by the static frequency converter/static start manufacturer.

19.2 The erecting engineer shall have at least two (2) years experience performing the requirements stated in paragraph 19.3, and shall be thoroughly familiar with the manufacturer's design. The erecting engineer's qualifications shall be submitted for approval not later than 60 days prior to installation of the equipment.

19.3 The erecting engineer shall provide and be responsible for complete and correct direction during the initial starting and all subsequent operation of the equipment until field tests are completed. The erecting engineer shall initiate instructions prior to shipment of the equipment for all actions necessary for the proper receipt, inspection, handling, temporary storage, assembly, and testing of the apparatus furnished to the erection Contractor by the Government under this contract. The erecting engineer shall keep a record of all measurements taken during erection and shall submit to the Government one copy either on request or on completion of installation of the assembly or part.

19.4 The erecting engineer shall instruct the Government's representatives in the operation and maintenance features of the work by conducting training courses in accordance with Part 4, Section 16155, Paragraph 3.6.

19.5 The erecting engineer shall provide technical expertise to the erecting contractor during installation and testing. The work and operations of the erecting engineer shall be coordinated with the program of construction at the erection site. The total cost for such services will be based on the total actual time that the services are required during installation and tests. However, actual time shall not exceed the estimated quantity specified in the pricing schedule without prior approval of the Contracting Officer.

19.6 For the services of the erecting engineer the contractor will be paid at the rate of the amount per calendar day stated in the contract for the number of calendar days that their service is required, including Sundays and National legal holidays. The payment shall cover the entire periods of time that the erecting engineer is in the service of the Government within the continental United States. This shall include the time required by them to travel by the most direct commercial airline from their home station or port of entry, or from duty station when travel time from duty station is less than that required from home station or port of entry, to the site of erection and return. When travel time from duty station is greater than that required from home station or port of entry, only time from home station or port of entry will be allowed. Travel time will only be allowed from time of first available transportation after release for return to home station or port of entry. Travel fare and other necessary transportation expenses will be paid under Bid Item No. 0012. No payment will be made for days the erection engineer is absent from the job site except for non-work days, i.e., National legal holidays, and authorized travel time. No additional or overtime payment will be made to the Contractor when the erecting engineer is required to work in excess of 8 hours per calendar day or 40 hours per week, on Saturdays, Sundays or National legal holidays.

19.7 In the event that delays occur during periods of assembly, erection, or testing, wherein the services of the erecting engineer is not required, the Government may direct the engineer to return to their home station, in which

case they will not be paid for the time they are not at the site of work, except for travel time; or direct the engineer to remain at the site of the work, in which case they will be paid as provided by the contract.

19.8 The Contractor shall not be paid for travel for Contractor personnel who reside in the metropolitan area in which the tasks are being performed. Travel shall not be paid for services performed at the Contractor's home facility and any facility required by the contract or at any location within a fifty- (50) mile radius of the Contractor's home facility and any facility required by this contract. For travel costs/personnel transportation other than described above, the Contractor shall be paid on the basis of the number of round trips at the rate in Bid Item No. 0012.

19.9 The Contractor agrees, in the performance of necessary travel, to use the lowest cost mode commensurate with the requirements of the mission and in accordance with good traffic management principles. When it is necessary to use rail service, the Contractor agrees to use coach, tourist class, or similar accommodations to the extent consistent with the successful and economical accomplishment of the mission for which travel is being performed. Air fare costs in excess of the lowest customary standard, coach, or equivalent airfare offered during normal business hours will only be allowable if they meet the terms and conditions as set forth in FAR 31.205-46. Personnel in travel status to and from the Contractor's plant and designated work site shall be considered as time of performance under this contract and the Contractor shall bill at the rate for Bid Item No. 0011.

19.10 The Contractor shall be responsible for making all the travel arrangements to support his personnel during the conduct of tasks assigned under this contract. All air travel shall be commercial airlines coach class, unless authorized in advance by the Contracting Officer. The Contractor shall make no direct labor charges for making travel arrangements.

20.0 SITE VISIT

Prospective bidders are invited to the project for a pre-bid site visit on 16 October 2002 from 8:00 a.m. to 4:00 p.m. Prospective bidders who plan to attend the scheduled site visit are asked to notify Ms. Gayle Barnes, the Powerhouse Superintendent, at telephone number 706-213-3462 prior to the date of the site visit.

PART 2

SECTION 01090

SOURCE OF REFERENCED PUBLICATIONS

1.1 STANDARD SPECIFICATIONS

Standard specifications of the following authorities referenced herein may be obtained from the addresses listed below:

NAME	ABBREVIATION
American National Standards Institute, Inc. 11 West 42nd Street New York, NY 10036	ANSI
American Society of Mechanical Engineers 22 Law Dr., P.O. Box 2300 Fairfield, NJ 07007-2300	ASME
American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103-1187	ASTM
American Welding Society, Inc. 550 N.W. LeJuene Road Miami, FL 33126	AWS
Federal Acquisition Regulations Order From: Government Printing Office Washington, DC 20402	FAR
Institute of Electrical and Electronics Engineers 445 Hoes Ln., P.O. Box 1331 Piscataway, NJ 08855-1331	IEEE
National Electrical Manufacturers Association Order Department 2101 L Street, N.W., Suite 300 Washington, DC 20037-1536	NEMA
National Fire Protection Association P.O. Box 9146 Quincy, MA 02169	NFPA
Underwriters' Laboratories, Inc. 333 Pfingsten Rd. Northbrook, IL 60062	UL
U.S. Army Corps of Engineers available from Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402	USACE

PART 3

SECTION 01270

MEASUREMENT AND PAYMENT

1.1 GENERAL INFORMATION

In each instance, the contract price for an item will constitute full compensation as herein specified, as shown, or as otherwise approved. The contract price and payment will also constitute full compensation for all work incidental to completion of the item, unless such work is otherwise specifically mentioned for separate payment under another bid item. In the event any work is required by the specification sections or by the drawings and not specifically mentioned in the measurement and payment paragraphs, separate or direct payment will not be made, and all costs thereof are incidental to, and included in, the contract prices and payment for all items listed in the bid schedule.

1.2 MEASUREMENT

Items measured as a job will be measured for payment as a complete job in the locations indicated. This measurement includes all incidental work and materials such as fittings, fasteners, electrical materials, and O&M manuals that are necessary to make a complete job. Unless the payment item paragraph makes a specific exception of any item, incidental items will not be measured under any other item even though there is another listing for the work or material.

1.3 PAYMENT

Payment for all work specified, shown or incidental to complete the work will be made as follows:

Bid Item 0001; Installation Engineering, Manufacture, Test, and Deliver One Static Frequency Control System

The installation engineering, manufacture, testing and delivery of the static frequency control system will be paid for under Bid Item No.0001, "Installation Engineering, Manufacture, Test, and Deliver One Static Frequency Control System" as described in Part 4, Section 16155. This work will be considered complete after the final testing reports have been submitted and approved, and the equipment has been delivered and accepted.

Bid Item 0002; Installation Engineering, Manufacture, Test, and Deliver Input and Output Transformers

The installation engineering, manufacture, testing and delivery of the input and output transformers will be paid for under Bid Item No.0002, "Installation Engineering, Manufacture, Test, and Deliver Input and Output Transformers" as described in Part 4, Section 16155. This work will be considered complete after the final testing reports have been submitted and approved, and the equipment has been delivered and accepted.

Bid Item 0003; Installation Engineering, Manufacture, Test, and Deliver Input and Output Circuit Breakers

The installation engineering, manufacture, testing and delivery of the input and output circuit breakers will be paid for under Bid Item No.0003, "Installation Engineering, Manufacture, Test, and Deliver Input and Output Circuit Breakers" as described in Part 4, Section 16155. This work will be considered complete after the final testing reports have been submitted and approved, and the equipment has been delivered and accepted.

Bid Item 0004; Installation Engineering, Manufacture, Test, and Deliver Current-Limiting Reactors

The installation engineering, manufacture, testing and delivery of the current-limiting reactors will be paid for under Bid Item No.0004, "Installation Engineering, Manufacture, Test, and Deliver Current-Limiting Reactors" as described in Part 4, Section 16155. This work will be considered complete after the final testing reports have been submitted and approved, and the equipment has been delivered and accepted.

Bid Item 0005; Installation Engineering, Manufacture, Test, and Deliver Isolated-Phase Bus

The installation engineering, manufacture, testing and delivery of the isolated-phase bus will be paid for under Bid Item No.0005, "Installation Engineering, Manufacture, Test, and Deliver Isolated-Phase Bus" as described in Part 4, Section 16155. This work will be considered complete after the final testing reports have been submitted and approved, and the equipment has been delivered and accepted.

Bid Item 0006; Perform Special Factory Tests

The performance of special factory tests of the static frequency control system will be paid for under Bid Item No. 0006, "Perform Special Factory Tests", as described in Part 4, Section 16155. This work will be considered complete after testing has been completed, inspection reports for the factory tests have been submitted by the Contractor, and the inspection reports have been approved by the Government.

Bid Item 0007; Perform Field Test

The performance of the field testing of the new static frequency control system and input/output circuit breakers will be paid for under Bid Item 0007, "Perform Field Test," as described in Part 4, Section 16155. The testing will be considered complete after the field test has been completed, inspection reports for the field tests have been submitted by the Contractor, and the inspection reports have been approved by the Government.

Bid Item 0008; Wrenches, Tools, and Special Equipment

The furnishing of wrenches, tools, and special equipment for the installation and maintenance of the static frequency control system will be paid for under Bid Item No. 0008, "Wrenches, Tools and Special Equipment," as described in Part 4, Section 16155. This work will be considered complete after the required materials have been delivered to the Richard B. Russell powerhouse.

Bid Item 0009; Spare Parts

The furnishing of spare parts for the static frequency control system will be paid for under Bid Item No. 0009, "Spare Parts," as described in Part 4, Section 16155. This work will be considered complete after delivery of all required spare parts to the Richard B. Russell powerhouse.

Bid Item 0010; Training of Government Personnel

The training of Government personnel on the operation and maintenance of the static frequency control system, will be paid for under Bid Item No. 0010, "Training of Government Personnel," as described in Part 4, Section 16155, Paragraph 3.6. This work will be considered complete after completion of the required classes at the Richard B. Russell powerhouse.

Bid Item 0011; Services of Erection Engineers

The services of erection engineers during installation, testing and commissioning of the static frequency control system will be paid for under Bid Item No. 0011 as described in Part 4, Section 16155, Paragraph 3.7.

Bid Item 0012; Travel Costs and Per Diem for Erection Engineers

The Travel Costs and Per Diem for Erection Engineers will be paid for under Bid Item 0012 as described in Part 4, Section 16155, Paragraph 3.7.

Bid Item 0013; The contractor shall be responsible for the cost of all loading and off-loading activities from any port-of-entry, if applicable, and at the RBR Powerhouse or other designated site at the RBR Project. These services will be paid for under Bid Item No. 0013 as described in Part 1, Paragraph 10, "Place of Delivery."

Bid Item 0014; Bid Data - Bid Data List. Exhibit A: NSP - Not Separately Priced.

Bid Item 0015; Contract Data - Contract Data List. Exhibit B: NSP - Not Separately Priced.

PART 4

SECTION 16155

STATIC START SYSTEM

1.0 GENERAL

1.1 GENERAL INFORMATION

1.1.1 Scope of Work

This section covers the work necessary to provide installation engineering, prepare drawings, data, and installation instructions, to manufacture, to shop test, to prepare and load for shipment, deliver f.o.b. destination, to off-load into the powerhouse, and to field test and make completely operational, one static start system for the Richard B. Russell Powerhouse. The contractor shall be responsible for the cost of all loading and off-loading activities from any port-of-entry, if applicable, and at the RBR Powerhouse or other designated site at the RBR Project. All equipment/materials, except bus work and associated components, shall be off-loaded with the Government's overhead crane in the erection bay and stored in the Richard B. Russell power plant. Crane-hook access to the loads necessitates that load be delivered on either flatbed or soft-top (roll-back top) trailers, as opposed to closed trailers. The Contractor shall be solely responsible for off-loading all bus work at the on-site storage yard, approximately one-half mile from the power plant. Any equipment requiring use of a spreader type lifting beam or other special rigging device, shall be provided by the Contractor and delivered with the first shipment requiring such devices. The static start system will be used to soft start a selected generator/motor from Units 5, 6, 7, or 8.

1.1.2 Description of Generators

The static start system shall be suitable for soft starting the existing hydro generator/motor units in the motor mode. All generator/motor units are 3-phase, 60 Hz, 13.8 kV, vertical, synchronous units, manufactured by GEC Alsthom. The generator/motor main characteristics and design data are as follows:

GENERATOR/MOTOR MANUFACTURER	GEC ALSTHOM
Synchronous speed (rpm)	120
Rated voltage (kV)	13.8
Voltage variation	+/- 5%
Rated frequency (Hz)	60
Rated power factor	0,95
Generator rating (kVA)	94500
Motor rating(HP)	137000
Line current of generator/motor	3955/4560
Number of poles	60
WD ² of rotating parts (10 ⁶ lb x ft ²)	90.5
Runaway speed (rpm)	205
No load field current, rated voltage (A)	835
Rated field current of generator/motor (A)	1350/1470
PUMP/TURBINE	
WD ² of pump/turbine (10 ⁶ lb x ft ²)	11.5

1.1.3 ADDITIONAL DATA:

TORQUE AS A MOTOR: Pull-out torque at 100% rated motor voltage, rated frequency, and rated power factor: 6,000,000 lb-ft

NET WEIGHTS:

Complete generator: 1,238,000 lb

Rotor without shaft: 572,000 lb

Shaft: 100,000 lb

Stator w/o coolers & housing: 320,000 lb

Rotor Lifting Device: 6,300 lb

Bearings, brackets, housing, misc (exc. surface air coolers): 236,000 lb

Surface air coolers: 10,000 lb

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)

ANSI C37.06 (2000) AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis - Preferred Ratings and Related Required Capabilities for Switchgear

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME BPV VIII (1998) Boiler and Pressure Vessel Code; Section VIII, Pressure Vessels Division 1 - Basic Coverage

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A123 (1997a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A153 (1995) Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM B253 (1987) Standard Guide for Preparation of Aluminum Alloys for Electroplating

ASTM D2472 (1992) Sulfur Hexafluoride

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1 (1998) Structural Welding Code - Steel

AWS D1.2 (1997) Structural Welding Code - Aluminum

AWS D10.7 (1986) Recommended Practices for Gas Shielded Arc Welding of Aluminum and Aluminum Alloy Pipe

AWS QC1 (1996) AWS Certification of Welding Inspectors

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 386 (1995) Separable Insulated Connector Systems for Power Distribution Systems Above 600 V

IEEE C37.04 (1999) Rating Structure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis

IEEE C37.09 (1998) Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis

IEEE C37.11 (1997) Standard Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis

IEEE C37.20.2 (1999) Metal-Clad and Station-Type Cubicle Switchgear

IEEE C37.20.3 (1997) Metal-Enclosed Interrupter Switchgear

IEEE C37.23 (1987; R 1991) Guide for Metal-Enclosed Bus and Calculating Losses in Isolated-Phase Bus

IEEE C37.90.1 (1989; R 1994) Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems

IEEE C37.100 (1992) Definitions for Power Switchgear

IEEE C57.12.01 (1998) Dry-Type Distribution and Power Transformers
Including Those with Solid Cast and/or Resin Encapsulated
Windings

IEEE C57.12.70 (2001) Terminal Markings and Connections for Distribution
and Power Transformers

IEEE C57.13 (1993) Instrument Transformers

IEEE C57.16 (1996) Standard Requirements, Terminology, and Test Code
for Dry-Type Air-Core Series-Connected Reactors

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA AB 3 (1996) Molded Case Circuit Breakers and Their Applications

NEMA SG 4 (1990) Alternating-Current High Voltage Circuit Breaker

NEMA SG 5 (1995) Power Switchgear Assemblies

NEMA WC 7 (1988; Rev 3 1996) Cross-Linked-Thermosetting-Polyethylene-
Insulated Wire and Cable for the Transmission and
Distribution of Electrical Energy

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1999) National Electrical Code

1.3 SUBMITTALS

Government Approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are For Information Only. The following shall be submitted in accordance with Part 1, Paragraphs 2.0 through 8.0.

SD-01 Data

Within 90 calendar days after date of receipt of signed contract:

Descriptive Specifications for the following; GA

- a. Isolated-Phase Bus, Disconnecting Links, Seal-Off Bushings.
- b. Current-Limiting Reactors: catalog cuts, test procedures, reactor ratings, reactor sizing calculation and data, voltage drop calculations and data.
- c. Input and Output Circuit Breakers: catalog cuts, test procedures, ratings.
- d. Input and Output Transformers: catalog cuts, test procedures, ratings.
- e. Static Frequency Converter: catalog cuts, test procedures, ratings.
- f. Wire and cable.

Excitation Parts List; GA

The list shall include all excitation system parts furnished for the control and interfacing requirements between the SFC and the existing motor/pump excitation system. Each part shall be numbered and cross-referenced to the drawings. Each part shall be identified by name, manufacturer, quantity furnished, and rating (ohms, farads, voltage, amperes, etc.,) as appropriate.

SFC Parts List; GA

The list shall include all parts to be included in the static start system, excluding excitation equipment, with each part numbered and cross-referenced to the drawings. Each part shall be identified by name, manufacturer, quantity furnished, and rating (ohms, farads, voltage, amperes, etc.,) as appropriate.

Spare Parts List; GA

The list shall include all Input and Output Circuit Breaker, SFC and excitation spare parts to be furnished under this contract, with each part numbered and cross-referenced to the drawings and the above parts lists. Each part shall be identified by name, manufacturer, rating (ohms, farads, etc., as appropriate) and quantity furnished. All proprietary or house-marked items (such as transformers, inductors, integrated circuits, or printed circuits) shall be identified along with their source. Printed circuit cards that require depot- or factory-level maintenance or that are uneconomical or too

complicated to repair shall also be identified. A price list for each spare part shall be furnished.

Contractor-Furnished Training; GA

Instructor background and qualifications, course outline, course material and subject matter for the theory, and operation and maintenance of the static system.

SD-04 Drawings

Schematic, control and programmable logic diagrams; GA

Within 45 calendar days after receipt of award notice, drawings as required to demonstrate fully that all parts of the equipment will conform to the requirements and intent of the specifications. The drawings shall include sectional views of all equipment, drawings, and one-line diagrams of the SFC and switchgear, schematic diagrams, SFC programmable logic diagrams, equipment lists and nameplate schedules. Drawings shall also show the proposed arrangement of terminal blocks and supports for incoming cables. The information on outgoing circuits will be provided by the Government when the drawings are received for approval, and shall be added to the drawings by the Contractor.

Outline Drawings; GA.

Within 60 calendar days after receipt of award notice, outline drawings of all equipment to be furnished with weights and overall dimensions. Drawings to include the detailed dimensions of all equipment; the size and location of conduit and cable entrances; details for bolting equipment to the floor, walls, and ceilings; recommended foundation details for embedding channel sill in floors; and details of all bus terminations. Drawings showing the recommended design and drilling of the channel sills and proposed equipment crate sizes and routing shall be included.

Assembly and Detail Drawings; GA

Within 60 calendar days after receipt of award notice, assembly and detailed drawings and data to demonstrate that all parts of the equipment will conform to the requirements and intent of the specifications. The drawings and data shall include sectional views of the switchgear units, reactors, isolated-phase bus, transformers and the SFC, and description of removable elements and all relays and other devices, one-line diagrams of the switchgear assembly and the SFC, schematic diagrams, complete assembly full-line connection diagrams, equipment lists, and nameplate schedules.

Connection Diagrams; GA.

Within 90 calendar days after receipt of award notice, the point-to-point wiring diagrams shall show all terminal blocks and connections between the blocks and switchgear equipment and between the blocks and the SFC, and shall provide a space at least 3 inches below and adjacent to the terminal blocks in which external circuits, conduits or connections may be shown. The wiring diagrams shall be made as seen by an observer of the actual wiring, and space shall be provided for the addition of devices where mounting space exists on the structure. Drawings shall also show the proposed arrangement of terminal blocks and supports for incoming cables. Additional information on outgoing circuits will be provided by the Government when the drawings are received for approval, and shall be added to the drawings by the Contractor.

Internal Drawings Showing all Components; GA

Within 60 days after receipt of award notice, internal drawings showing all components, internal physical arrangement, and required clearance areas shall be provided to the Government by the Contractor. All internal wiring terminal blocks shall be indicated and labeled.

SD-06 Instructions

Within 120 calendar days after receipt of award notice, the following manuals shall be submitted in accordance with Part 1, Paragraphs 2.0 through 8.0:

Static Starting System Start-up/Adjustment/Testing Procedure; GA

A detailed comprehensive manual, complete with testing schematic diagrams, switching procedures, etc., shall be provided to the Government by the Contractor for review and approval.

Operation and Maintenance Manual; GA

A detailed, comprehensive manual for operating and performing maintenance and troubleshooting of all equipment furnished under this contract shall be provided to the Government by the Contractor. The manual shall have a complete set of schematic diagrams, typical problems, solutions, parts list, typical waveforms and voltages in order to facilitate maintenance activities.

Test Set Manual; FIO

The Contractor shall furnish a manual that provides instructions to government personnel on the use of the Test Set provided. The instructions shall include the programming of the SFC controller, the use of the diagnostic programs, and explanatory material describing the possible test results and problem diagnoses. The manual shall be organized with a table of contents and index.

SD-09 Reports

Within 90 calendar days after receipt of award notice:

Materials; FIO.

All materials incorporated into the work shall be tested, except as otherwise indicated or where such tests are waived in writing. If the Contractor desires to use stock material not manufactured specifically for the work covered by these specifications, evidence shall be submitted certifying that such material conforms to the requirements of these specifications, in which case detailed tests on these materials may be waived. Unless waived in writing, all tests or trials shall be made in the presence of a Government Quality Assurance Representative (GQAR). The test reports shall be furnished as soon as practical after the tests are made and shall be submitted in such form as to provide a means for determining compliance with the applicable specifications for the material tests.

Factory Test Procedure; GA

An outline and description of the test methods and equipment to be employed in all factory tests, including test values and rejection criteria.

Factory Tests; GA

The test report shall include descriptions of the tests performed, test results with tolerances, sample calculations, and the formulas used in determining the results of the tests. The test reports shall be submitted within 10 days after the tests are made. In addition to these requirements, the following curves and data shall be included in the test report showing the characteristics of the static frequency converter start system as determined by the factory tests:

- (1) Efficiency, KW consumption, voltage, and power factor versus speed.
- (2) Computation of static frequency converter KW consumption.

Field Test Procedure; GA

An outline and description of the test methods and equipment to be employed in all field tests, including test values and rejection criteria.

Field Tests; GA

Unless waived in writing, all tests or trials shall be witnessed by the GQAR. Field test reports shall include descriptions of the tests performed, sample calculations, and formulas used in determining the results of the tests. Test data shall also be included in the field test reports. The test reports shall be submitted within 10 days after the tests are made.

SD-13 Certificates

Metal-Clad Circuit Breakers Certifications; GA

A certified statement shall be provided by the manufacturer of the metal-clad circuit breakers that design tests in accordance with IEEE C37.09 have been previously made on power circuit breakers of the same design, construction, and ratings as those furnished under this contract and that the results of the tests prove the adequacy of the design of the circuit breakers to operate satisfactorily under normal and short-circuit conditions when applied within their ratings. Certification shall be submitted prior to acceptance for shipment of the equipment.

SD-18 Records

As-Built Drawings; GA

Not later than 60 calendar days after completion of the work submit a complete set of as-built drawings showing all work up to the time of contract completion and acceptance by the Government.

1.4 GOVERNMENT EQUIPMENT INTERFACE

1.4.1 DC Voltage Source—Control

Power from a properly protected, ungrounded, rated 125 Vdc source, which has a range of 100 Vdc to 140 Vdc, is available.

1.4.2 AC Voltage Source—Lighting

120 Vac single-phase power for static start system convenience receptacles and light fixtures is available.

1.4.3 AC Voltage Source—Transformer Cooling Fans

480 Vac three-phase power is available for interconnection with the new equipment cooling fans.

2.0 PRODUCTS

2.1 MATERIALS AND WIRING

2.1.1 Materials

All materials shall conform to the applicable requirements of these specifications. The classification and grade of materials incorporated in the work shall be in accordance with the specifications designated herein. Substitution of materials from those specified shall not be made except on specific prior written approval. Any materials required in the work not covered by specifications shall be submitted for approval for the purpose intended. Reference to any equipment, article, or catalog number shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may use any equipment, material or article which, in the judgment of the Contracting Officer, is approved as a suitable equal. The use of asbestos or polychlorinated biphenyl's (PCB's) shall not be permitted. Where stiffness of the part is a requirement, approval will not be granted of any material which, if accepted, would decrease the stiffness of the part.

2.1.2 Prevention Of Corrosion

All metallic materials shall be protected against corrosion. Exposed metallic parts of outdoor equipment or devices shall be given a rust-inhibiting treatment and standard finish by the manufacturer. Aluminum shall not be used in contact with the earth, and where it is in contact with concrete or connected to dissimilar metal, it shall be protected by approved coating, fittings, and treatment. All parts such as boxes, bodies, fittings, guards, and miscellaneous parts made of ferrous metals but not of corrosion-resistant steel, shall be zinc-coated in accordance with ASTM A123 or A153, except where other equivalent protective treatment is specifically approved in writing.

2.1.3 Wiring

2.1.3.1 Control Wiring

All control wire, including wire for removable elements, shall be stranded copper switchboard wire with 600 volt insulation. The wire shall be type SIS as listed in NFPA 70, shall meet the requirements of NEMA WC 7, and shall pass the flame test requirements of paragraph 7.7.3.1.3 of NEMA WC 7. Hinge wire shall have Class K stranding. Current transformer secondary leads shall be not smaller than No. 10 AWG. Minimum wire size for all other control wiring shall be No. 14 AWG.

2.1.3.2 Wiring Duct

A suitable wiring duct system shall be installed for all interpanel wiring and shall provide easy access for inspection and replacement of wiring. All wiring shall be installed in wiring channels and ducts as far as possible. Each wire shall be properly protected where it leaves a channel or duct.

2.1.3.3 Wire Bundles

Wiring, where not installed in channels or ducts, shall be formed into compact wire bundles suitably bound together and properly supported. Bindings and supports shall not cause damage or cold flow of the insulation. Groups of exposed wires shall be run straight horizontally or vertically with short-radius right angle bends. Wiring supports shall be of heavy gage rustproof material or steel with rust-resisting finish equivalent to sherardizing or cadmium-zinc plating. There shall be no splices in the wiring and all connections shall be made at terminal studs or terminal blocks with ring-tongue indented terminals. All screw terminals shall have toothed lockwashers and all stud terminals shall have contact nuts and either locking nuts or lockwashers. Each conductor shall be identified at each end with a permanently machine-embossed black identification on white plastic tubular shrink-on marker with the markings as shown for the terminal blocks on the Contractor's connection diagram.

2.1.3.4 Wiring in High Voltage Compartments

Any control wiring within high voltage compartments shall be completely shielded in a protective metal enclosure. Interpanel terminal blocks shall be used for interconnecting the wiring between adjacent panels at shipping splits. Hinge wire shall be used between stationary panels and swinging panels or swinging doors and shall be formed in vertical wire loops which shall provide rotation around the longitudinal axis of the conductors. Instrument transformer secondary circuits shall be grounded at the switchgear. All leads from each individual instrument transformer shall be brought out to terminal blocks.

2.1.3.5 Terminal Blocks

Terminal blocks and internal wiring shall be provided to all breaker spare auxiliary contacts and control device spare contacts for the connection of remote circuits. Terminal blocks shall be provided to terminate all external cables and shall contain at least 10 percent spare terminals. Suitable provisions shall be made for training and supporting incoming cables from the point of entrance to their termination on terminal blocks. All terminal blocks shall be accessible from the front of the switchgear unit with the front door open and the circuit breaker in the operate position. Drawings showing the proposed arrangement of terminal blocks and supports for incoming cables shall be submitted for approval.

2.1.3.6 External Cables

Special attention shall be given to wiring and terminal arrangement to permit the individual conductors of an external cable to be conveniently grouped for connection to adjacent terminal points. Suitable entrance locations shall be indicated on the Contractor's shop drawings for entrance of all external control cables.

2.1.3.7 Power Cables

Power cables in conduit will enter the equipment from the top as shown. Multigrip clamp type terminals shall be furnished for terminating the 15 kV copper cables with sufficient space provided for construction of stress cones.

2.1.3.8 Wire Designations

The wire (terminal point) designations used on the Contractor's wiring diagrams and printed on terminal block marking strips may be according to the Contractor's standard practice; however, additional wire and cable designations for identification of remote (external) circuits will be

required, and drawings submitted for approval will be so marked and returned to the Contractor for additional designations. Drawings prepared by the Contractor may require revision of external circuit connections, terminal block and wire designations, and wire grouping when submitted for approval.

2.2 STATIC START SYSTEM DESCRIPTION

2.2.1 General

The static start system is to be furnished for the purpose of providing a soft start for existing hydro-generator/motor Units No. 5, 6, 7, & 8 when starting them in the motor-pump mode. One static start system shall be provided to start the selected motor. Only one motor-pump will be started at a time. The existing start system uses generator Unit 2 or generator Unit 3 as a driving Unit to start Unit 5, 6, 7, or 8 motor-pump. Unit 2 or 3 is currently controlled manually during pump start-up and acts as a reduced frequency, reduced voltage generator.

2.3 STATIC STARTING EQUIPMENT

2.3.1 Type and Description

The static starting equipment, including the input transformer(s) and output transformer(s), shall be a 3-phase static frequency converter or power controller, rated at a minimum of 12.7 MW output (with voltage rating determined by starter manufacturer), 6/6 pulse, current-source, capable of accelerating a synchronous motor from standstill to synchronous speed, and synchronize unit to system. The static starting equipment shall be capable of breaking the motor away from a dead stop. At synchronous speed, the static starter shall synchronize the motor to the system bus. The starter shall be designed to start the four (4) motors, one at a time.

The Contractor will be responsible to adequately size the SFC system to guarantee a soft start of one pump taking it from standstill to synchronizing the unit (rated voltages and speed) to the system. The equipment shall be solid-state, modular design, or digital and shall consist primarily of a 3-phase input transformer, rectifier, d-c link reactor, inverter, output transformer switch and bypass switch, and 3-phase output transformer. In addition the static starting equipment shall be provided with controls, instruments, and alarms as described in the following paragraphs of these specifications. No auxiliary equipment, such as a cyclo-converter, shall be permitted to break the motor away from a dead stop.

2.3.2 Rating

2.3.2.1 The static starting equipment continuous duty rating at rated speed (60 Hz), including input transformer(s) and output transformer(s), shall be 12.7 MW as a minimum, however, the Contractor will be responsible to propose the appropriate SFC size to guarantee the soft start of one pump. The line-to-line voltage at the input and output terminals of the transformers shall be 13.8 kilovolts. The equipment shall operate over an input voltage range of 13.8 kilovolts plus or minus 5 percent and frequency range of 60 plus or minus 0.1 hertz.

2.3.2.2 The static starting equipment shall accelerate and synchronize any one (1) of the four (4) motors over the voltage and frequency range stated above in a minimum amount of time (not to exceed five minutes) consistent with the current limitations of the power components. Actual synchronization will take place across the respective 15 kV generator circuit breaker. The starter shall be capable of five (5) unit starts per hour without exceeding its

temperature rise limitations. No other intentional speed control is required during acceleration, except at synchronous speed for synchronizing.

2.3.2.3 All equipment shall be designed to operate at an ambient temperature of 40° C. without derating. The rectifier/inverter sections and all other power components shall be designed to safely contain and minimize damage due to internal short circuits that must be cleared by internal protective devices or the new input circuit breakers (767 or 777), with a 20,000 rms, symmetrical-amperes system, short-circuit capacity at the input transformer high-voltage terminals.

2.3.3 Motor and Pump Characteristics

2.3.3.1 The starting equipment shall be designed to be compatible with the characteristics of the synchronous motors and their associated pumps. Each motor has one 3-phase set of stator windings and is connected wye with a high-resistance, neutral-grounded scheme. The plant water depressing system is designed to allow the pumps to start dewatered. The power required to run a dewatered pump at synchronous speed was measured to be 3.5 MW.

2.3.3.2 Summary of motor characteristics. A summary of motor characteristics is listed in paragraph 1.1.2.

2.3.4 Existing Excitation/Regulation System. Each motor is provided with a static excitation system which provides field current to the motor via brushes and slip rings. The main characteristics are listed below.

a. Manufacturer - Westinghouse (Cutler-Hammer presently owns the Westinghouse excitation facilities)

b. Date of manufacturer - 1988

c. General order number FA-13746-1

d. A partial set of excitation system shop drawings is included as reference drawings. These are the only drawings the government will make available to the Contractor. The Contractor is responsible for obtaining any other additional drawings desired of the excitation system or any additional information required to complete the installation engineering.

The Contractor shall be responsible for determining if existing Units excitation systems are compatible with all interfacing requirements of the SFC control system. The Contractor shall determine if all excitation equipment, contacts, etc. are in place to carry out all SFC commands, and has all required contacts needed by the SFC for inputs. The Contractor shall submit a detailed list of equipment missing from the excitation system that is required in order for the SFC system to work and shall provide such miscellaneous equipment and materials as part of its scope of work covered by this Contract. One spare shall be furnished for each piece of equipment (e.g. control switch, indicating light, transducer, PLC, relay, potentiometer, etc.).

2.3.5 Limiting Dimensions

The new static frequency converter and the input and output transformers will be installed in the existing switchgear room service bay. Access to the room is through a doorway measuring 8 feet wide by 9 feet 11 inches high. All equipment furnished must be capable of passing through this access opening.

2.3.6 Rectifier/Inverter Sections

2.3.6.1 General

The rectifier/inverter sections of the static frequency converter shall be equipped with static components. The initial capacity of the thyristor shall have an allowance to cover any loss in the capacity which may be caused by aging. Voltage spike protection shall be provided.

2.3.6.2 Enclosure

The rectifier/inverter equipment shall be housed in a NEMA 1, free-standing, dead-front, ventilated steel enclosure of not less than 10 MSG, with steel framework. The rectifier/inverter unit enclosures are shown on plan drawing E201 to indicate the available limited space for installing the unit. The unit shall consist of not more than 4 separate enclosures with maximum dimensions of 3' deep by 19' long each. Each enclosure shall be suitable for back to back mounting. Access for operation and maintenance shall be from the front through hinged doors. Interior and exterior steel surfaces of equipment enclosures shall be thoroughly cleaned after fabrication by sandblasting, pickling and rinsing, or by other approved means and then receive a rust-inhibitive phosphatizing or equivalent treatment prior to painting in accordance with IEEE C37.20.2. Interior surfaces shall receive not less than one coat of corrosion-resisting paint in accordance with the manufacturer standard practice. Exterior surfaces shall be primed, filled where necessary, and given not less than two coats of quick air-drying lacquer or synthetic enamel with semigloss finish, ANSI Standard Indoor Light Gray No. 61 in color.

2.3.6.3 Ventilation/cooling

The enclosure shall be properly sized to dissipate the heat generated by the rectifiers within the limits of the environmental operating conditions. Fans shall be provided within the enclosure to aid in circulating the environmental air into and out of the enclosure. Environmental air shall be drawn from near the floor and discharged from near the top of the enclosure. All ventilation openings shall be provided with filters of the throwaway type. Fans shall be suitable for operation from an external 480-volt, 3-phase power supply. Supplemental liquid cooling will not be permitted.

2.3.6.4 Design

The rectifier/inverter shall be of modular design such that the modules can be readily removed for inspection or replacement.

2.3.6.5 Protective Relays

The following protective relays and devices shall be provided:

- a. Overcurrent protection relay.
- b. Ground detection relay.

2.3.7 D-C Link Reactor

2.3.7.1 General

The d-c link reactor, if required by the Contractor's design, shall be dry-type, air or magnetic core, convection-cooled, with class F or H insulation, but not to exceed class B temperature rise. The reactor shall meet the applicable requirements of IEEE C57.12.01 for construction and materials. The audible sound level of the enclosed reactor when operating at rated load shall not exceed 80 dB.

2.3.7.2 Enclosure

The d-c link reactor shall be housed in a free-standing, ventilated-steel, or expanded metal enclosure of not less than 10 MSG, with steel framework. The enclosure may be open on the bottom so the reactor can be supported by the floor. As an option the reactor may be housed in the same lineup with the rectifier/inverter unit. Exterior surfaces shall be primed, filled where necessary, and given not less than two coats of quick air-drying lacquer or synthetic enamel with semi-gloss finish, ANSI Standard Indoor Light Gray No. 61 in color.

2.3.7.3 Ventilation/cooling

The enclosure shall be properly sized to dissipate the heat generated by the reactor. Fans may be provided within the enclosure to aid in circulating environmental air into and out of the enclosure. Fans shall be suitable for operation from an external 480-volt, 3-phase power supply.

2.3.8 Controls

2.3.8.1 General

The Contractor shall provide the local control, protection, metering (machine voltage, line voltage converter current and unit speed), indication, annunciation, and auxiliary power features stated below for the static starter and for interface to the plant control (paragraph 2.3.9.5) and auxiliary power systems as well as to each and all pump Units No. 5 through 8. The Government will perform the grounding, conduit and cable installation and termination of incoming circuits. Checkout and testing work will be performed by the Government and the Contractor's Commissioning Engineer as described in paragraphs 3.1.3 and 3.3.9. In the following subparagraphs, the term "control" will sometimes be used in lieu of "protection, metering, indication, annunciation, and auxiliary power" for brevity.

2.3.8.2 Existing Installation

2.3.8.2.1 Existing Starting System

The existing starting system uses generator Unit 2 or generator Unit 3 as a driving Unit to start Units 5, 6, 7, or 8 motor-pump. Unit 2 or 3 is controlled by automatic means and acts as a reduced frequency, reduced voltage generator. The existing reduced voltage-reduced frequency start system will be removed by others.

2.3.8.2.2 Synchronizing

The starting mode of the new static starting system shall bring the motor to rated voltage and rated or slightly above rated speed from a dead stop. The existing synchronizing system shall control the pump unit speed and phase angle via the new static frequency converter and control the pump unit voltage via the existing excitation/regulation system during the synchronization process. Once the Unit is brought to rated voltage and rated speed, it shall be synchronized to the 230 kilovolt bus via the unit breaker (750, 760, 770, or 780). After synchronizing has taken place and the unit breaker has closed, the SFC shall be automatically turned off, the output circuit breaker shall be automatically opened, and then an output signal shall be initiated to automatically open the input selected circuit breaker switch on the 13.8kV side of the input power transformer. An output signal shall be initiated to signal the motor starting switch to open.

2.3.9 Special Considerations

2.3.9.1 Control Logic

The new starting system shall contain logic that provides an interlock to ensure that when one Unit is being started by the static starting system the other Units cannot be simultaneously started by the system. Automatic closing of the new input circuit breaker, the new output starting breaker, and the new motor starting switch, at the appropriate time during the starting sequence shall be controlled via auxiliary contact closures in the SFC.

2.3.9.2 Additional Controls

The new static start system input circuit breakers (767 and 777) will be electrically interlocked by the Government such that only one can be closed at a time.

2.3.9.3 Heaters, Fans, and Lighting

Heaters must be furnished in the new equipment to prevent condensation. All heater and cooling fan circuits shall be 480 volts alternating current, 3 phase. All lighting circuits shall be 120 volts alternating current.

2.3.9.4 Auxiliary Relays

Auxiliary self reset relays shall be furnished and installed as required by the Contractor, particularly output circuits which operate coils of breakers. All coils shall be rated 125 VDC. Relays shall be provided with surge suppression on the coils. Contacts shall be of the convertible type suitable for operation on 125 volt DC, capable of carrying 10 amperes continuously and designed for easy change from either the normally open or normally closed positions in the field. The single-contact inductive load interrupting capacity shall not be less than 1.1 amperes for 125 volt DC operation. The relays shall be provided with the number of contacts required to perform the necessary function with an additional one normally open and one normally closed spare contacts for Government use. DC coils shall be capable of operation between 100 and 140 VDC.

2.3.9.5 Control Requirements

The Contractor's design shall provide a complete control system for the control, monitoring, troubleshooting, alarm, and protection of the static starting system and synchronizing equipment. These controls shall interface to the existing plant control systems and be suitable for operation from these 125 volt d.c. circuits whose commands are located in the plant control room. The Contractor shall prepare I/O connection drawings to enable the Government to make the interconnect between the new SFC and the existing unit and plant control systems. The control system logic shall be of computer-based, digital design. The control system shall be designed to be compatible with the static frequency converter and the present operating scheme of the plant.

a. Logic - The control logic shall be programmable and shall be programmed to provide the output signals and accept the input signals to operate the static start system to allow starting of the motor units. Refer to drawing E3, Block Drawing, and Section "Control Requirements," paragraph b. "Inputs" and paragraph c. "Outputs" for the required interfaces and signals.

The control logic shall provide for remote control (start) inputs from the control room operator as well as emergency shutdown on command from the plant

protection devices. Likewise, alarm, control, and shutdown outputs from the static frequency converter control system shall be provided for use in the plant control systems.

The Contractor programming shall include logic "interlocks" such that only one unit at a time may be started by the static frequency converter. Upon receipt of a control command to start a given unit, logic in the static frequency converter shall prevent any control action by the static frequency converter that would affect the other units, including control of the input and output breakers.

Control input and output modules of the static frequency converter that interface to plant 125-volt, direct-current control circuits shall be fully rated for 125-volt, direct-current service. The use of "cascaded" relay logic to accomplish full voltage rating will not be acceptable.

Logic programming shall perform continuous checks of the status of inputs. The incorrect change of status of critical inputs at any time in the start sequence shall cause immediate abort of the control sequencing.

The control system shall be self monitoring for troubles and failures. Full diagnostic capability including data storage in nonvolatile memory shall be provided. Alarm and shutdown outputs shall be provided for these conditions.

The Contractor shall perform all initial programming of the computer-based controller. All control system logic shall be reviewed and approved by the Government. All control logic programming shall be stored in non-volatile memory.

b. Inputs - In addition to the inputs used between the SFC equipment components and between the exciter and the SFC, the Contractor shall furnish, as a minimum, the following input points for the SFC:

1. Input transformer temperature trip
2. Output transformer temperature trip
3. Input breaker 767 protection trip
4. Input breaker 777 protection trip
5. Output breaker 901 protection trip
6. Output breaker 901 is closed
7. Select Unit 5
8. Select Unit 6
9. Select Unit 7
10. Select Unit 8
11. Stop SFC mode
12. Raise speed
13. Lower speed
14. Unit 5 speed > 25%
15. Unit 6 speed > 25%
16. Unit 7 speed > 25%
17. Unit 8 speed > 25%
18. Unit 5 generator breaker closed
19. Unit 6 generator breaker closed
20. Unit 7 generator breaker closed
21. Unit 8 generator breaker closed
22. Motor starting switch open
23. Motor starting switch closed
- 24-48. Spare inputs

c. Outputs - In addition to the control, alarm, and shutdown

outputs used between the SFC equipment components and between the exciter and SFC, the Contractor shall furnish, as a minimum, the following outputs:

c.1. Alarm and/or shutdown contacts for rectifier failure, inverter failure, input filter overtemperature, input filter fail, input and output transformers over-temperature, abort sequence started, logic failure, power supply failures, incomplete logic sequence, rectifier/inverter overcurrent, rectifier/inverter over-temperature, and unit stator overvoltage.

c.2.

1. Trip command for input breaker 767
2. Trip command for input breaker 777
3. Trip command for output breaker 901
4. Close command for output breaker 901
5. Close command for input breaker 767
6. Close command for input breaker 777
7. SFC ready to start
8. SFC alarm
9. SFC trip
10. Unit 5 95% speed reached
11. Unit 6 95% speed reached
12. Unit 7 95% speed reached
13. Unit 8 95% speed reached
14. Select no-load field current for Excit. 5
15. Select no-load field current for Excit. 6
16. Select no-load field current for Excit. 7
17. Select no-load field current for Excit. 8
18. Brake release Unit 5
19. Brake release Unit 6
20. Brake release Unit 7
21. Brake release Unit 8
22. Input filter close
23. Input filter trip
24. Motor starting switch close
25. Motor starting switch open
- 26-40. Spare outputs

d. Each output contact shall be electrically isolated so that they may be used in separate, independent circuits. Inputs and outputs shall have adequate isolation to prevent them from damage and to prevent damaging transients from entering the controller and shall meet the requirements of IEEE C37.90.1 (Surge Withstand Capability)

e. Operator interface - The static frequency converter system shall be designed to be "user friendly." All control interfaces for Contractor-furnished equipment shall be made at a control or terminal cabinet in the static frequency equipment. The normal mode of operation shall permit start control of the static frequency converter by the operator in the control room via control interfaces to be shown on shop drawings and to be furnished by the Contractor. Complete operation of the starter shall be possible from the static frequency converter control cabinet for testing and troubleshooting purposes.

f. Diagnostics - Operation of the static frequency converter from the control cabinet shall include the ability to override plant inputs and static frequency converter outputs to run complete or partial checkouts and testing without affecting plant status. The static frequency converter shall be provided with complete diagnostic capability to permit easy identification of trouble and failure

conditions. The diagnostic system shall include the required software and interface modules which shall enable use of the Contractor furnished Test Set at the control panel, for monitoring of control sequences and alarm/shutdown conditions and for revising the programming of the control sequences. Diagnostics shall include the capability to clearly identify at what point in control logic sequences failure occurs, and exactly what control system and power system components are in trouble monitoring electrical quantities with external test or failure condition. Adequate test points for equipment shall be provided and it shall be possible to insert simulation signals into critical points in the electronic circuitry where needed.

g. Contractor furnished Test Set. A laptop computer shall be provided to function as a Test Set. The Test Set shall consist of a laptop computer with minimum processing power of a 700 MHZ Pentium III based computer, an active color matrix display and PCMCIA slots. The RAM memory and the hard disk shall be sized for at least 50% spare capacity. As a minimum the computer shall have 64 MB of RAM memory, a 3.5 inch floppy drive, a 10 GB hard drive and CDRom drive. The Test Set shall also have a 56 Kbps fax/modem, 2 rechargeable batteries, battery charger and any communication card, network card, cables, connectors and software that is required to allow the test set to communicate with the SFC equipment. The Contractor shall provide a padded case for the Test Set. Battery charger power source for the test equipment shall be 117 VAC. The Test Set shall be loaded with the final version of the SFC control sequence program and with software that allows modification and reinstallation of the sequences into the SFC equipment.

h. Control cabinet - Control cabinet shall be furnished by the Contractor to be the centralized control interface point to the plant. The Government will terminate incoming cables in the control cabinet in accordance with Contractor-furnished connection diagrams. In the SFC, the Contractor shall furnish all required terminal blocks, ground bus, and other control devices necessary to make a complete installation.

(1) Terminal blocks - Terminal blocks shall be sliding link type, rated at 600 volts and 30 amperes minimum and shall be heavy duty type; shall be suitable for use with Government incoming No. 12 AWG wire; shall be molded-block type; shall be furnished with binding head or washer head screws having serrated or grooved contact surfaces or having lockwashers; and shall be furnished with molded insulating barriers between terminals. Terminal blocks for current transformer leads shall be short-circuiting type. Each terminal block shall have a removable marking strip. The arrangement and location shall be such that incoming and outgoing cables can be supported. Adjacent rows of terminal blocks shall be separated at least 6 inches, edge to edge, and shall be at least 6 inches from any edge of the cabinet. Approved Contractor conductor designations shall be machine lettered, stamped, engraved or neatly marked with permanent ink on one side of the terminal block marking strips. The terminal blocks shall be provided with 10% spare terminals for Government termination of spare conductors in each control cable and possible future uses.

(2) Ground bus - A copper bar, 2 inch in width and 1/4 inch thick, shall be mounted near the bottom of the control cabinet to function as a ground bus. The copper bar shall be electrically bonded to the cabinet. The ground bus shall be drilled and tapped for a minimum of 20 No. 10-32 screws. Each tapped hole shall be furnished with a No. 10-32 screw. The ground bus shall be mounted so that the screws can be screwed in completely such that the screw head touches the bus. Furnish a compression type cable connector at each end of the ground bar suitable for a 250 mcm copper cable.

i. Settings and variables - The Contractor shall be responsible for programming all variables (parameters) into the controller and making all settings to static frequency converter control and protection devices. The Contractor shall furnish a complete listing of all such variables and settings in the maintenance manuals for Government use. The Contractor shall provide recommended settings for control and protective devices outside the static frequency converter which may affect static frequency converter operation as required by the Government.

2.3.10 Wiring

Wiring shall be as described in Paragraph 2.1.3.

2.3.11 Name Plates and Warning Signs

a. Engraved nameplates and warning signs shall be of an appropriate size and the engraving material shall be approved by the Contracting Officer. Nameplates and warning signs shall be provided for the following.

(1) Nameplates for each section of equipment.

(2) Nameplates for each door-mounted device.

(3) Nameplates for each device that is mounted within the equipment enclosure. In lieu of nameplates, permanent marking of each device with its standard designation is acceptable.

(4) A "DANGER-HIGH VOLTAGE" sign shall be mounted on the access door or barrier to each high-voltage compartment.

(5) Nameplates shall be attached with screws.

2.3.12 Certification of Reliability of Components

The Contractor shall provide certification of the reliability of the electronic equipment that he is providing. The rectifier section, the inverter section, and the control section shall be considered to be the electronic equipment. Certification shall be based upon the tested reliability of each component and the number of components in the equipment. The MTBF (Mean Time Between Failures) of the electronic equipment shall be 30,000 hours minimum.

2.3.13 Static Frequency Converter Spare Parts

The Contractor shall furnish the following spare parts for the SFC:

a. Electronic printed circuit board of each type.

b. Power Supply of each type and rating.

c. Instrumentation Device of each type.

d. Current Transformer of each type and rating.

e. Potential Transformer of each type and rating.

f. Transducer of each type.

g. Two auxiliary relays of each type and rating.

- h. Analog Input card.
- i. Digital Input card.
- j. Digital Output card.
- k. Cooling Fan.
- l. Four Thyristors with two snubber circuits.
- m. One-quart container of finish paint (touch-up) ANSI No. 61.
- n. Spare CPU
- o. Rack unit for the PLC.

2.3.14 Excitation Equipment Spare Parts

All spares furnished shall be interchangeable with and shall be of the same material and workmanship as the corresponding original parts.

2.3.15 Tools And Special Equipment

2.3.15.1 The Contractor Shall Furnish

a. One set of special tools and wrenches required for the installation, maintenance, and repair of the equipment.

b. One set of lifting bars or eyes and slings as required for lifting the equipment furnished.

2.4 INPUT AND OUTPUT TRANSFORMERS

The Contractor shall furnish the following equipment associated with the new static start system:

2.4.1 General

An input power transformer will be required to step-down the input power source voltage for the new static frequency converter (or power controller) from 13.8 kV to the voltage rating of the new converter. Also, an output power transformer will be required to step-up the inverter output voltage level to 13.8 kV.

2.4.2 Power Potential Transformer

The transformers shall be fan-cooled, ventilated dry type, three-phase, 60 Hz, 13,800 volt delta-connected primary and shall have copper windings. The transformer primary BIL rating shall be 95kV. The kVA rating and secondary voltage rating shall be determined by the static frequency converter manufacturer. These rating calculations shall be submitted by the Contractor for review and final approval by the Contracting Officer. The transformer shall have a 220 degrees C insulation system, but shall be designed to carry its rated load continuously without exceeding 115 degrees C rise. The transformer shall conform to the applicable requirements of IEEE C57.12.01. The transformer shall have copper windings, an electrostatic shield and shall be designed for rectifier duty (must be a K-factor rated transformer). The Contractor shall submit K-factor calculations for the static starter load to verify the K-factor rating of the transformer. Two full capacity (2-1/2% each) taps above and two full capacity (2-1/2% each) taps below normal voltage

shall be provided. The transformer shall be provided with a semi-flush cabinet mounted dial, LED or LCD type indicator with sensing bulb and two independent temperature operated single pole normally open electrical contacts. The indicator shall be calibrated to read transformer hot spot temperatures. Contacts shall be designated as 49T1 and 49T2 and shall be rated 0.1 amp at 125 volts dc. Contact 49T1 shall be used for SFC trip for over temperature and contact 49T2 shall be used as a spare. The contacts shall be set at the manufacturer's recommended settings. All contacts shall be field adjustable. The transformer shall be provided with vibration mounts and shall conform to the applicable requirements of IEEE C57.12.70. The primary terminals of the input transformer(s) shall be provided with 15kV bushing wells suitable for 600 ampere dead break elbow connectors. The bushing wells shall conform to IEEE 386, Separable Insulated Connector Systems. Four (4) bushing wells shall be provided for each primary terminal to accommodate the field cable connections. The transformer shall be installed in an enclosure as described in paragraph 2.3.3 hereinafter. Primary and secondary power and control conduits and wiring shall enter from the top of the enclosure. It is anticipated, that due to the physical dimensions of the existing building access doors, that two smaller transformers connected in parallel will have to be furnished as the input transformer and the same for the output transformer. The existing access doorway dimensions are 8'-0" wide by 9'-11" high. The transformers must be moved through this doorway.

2.4.3 Enclosure

The transformers enclosure maximum dimensions shall not exceed 9'-0" high by 7'-6" wide. These dimensions will allow the transformer to be moved through the existing building access doorway for installation. The transformers shall be provided with a ventilated sheet steel enclosure of not less than No. 10 MSG. Two ground pads shall be furnished at opposite corners of the transformer at the bottom portion of housing. Doors or removable panels shall be provided in the enclosure to permit access to the transformer, and suitable removable lifting eyes or other approved means shall be provided to permit lifting the enclosure alone and also the complete transformer by the use of a crane. Bases shall be heavy channel to permit skidding and jacking in any direction. The enclosure shall be adequately braced and stiffened on the inside, and shall be coated with sound-deadening material if necessary, so that the audible sound level of the enclosed transformer when operating at rated load shall not exceed 80 dB. Interior and exterior steel surfaces of equipment enclosures shall be thoroughly cleaned after fabrication by sandblasting, pickling and rinsing, or by other approved means and then receive a rust-inhibitive phosphatizing or equivalent treatment prior to painting in accordance with IEEE C37.20.2. Interior surfaces shall receive not less than one coat of corrosion-resisting paint in accordance with the manufacturer standard practice. Exterior surfaces shall be primed, filled where necessary, and given not less than two coats of quick air-drying lacquer or synthetic enamel with semi-gloss finish, ANSI Standard Indoor Light Gray No. 61 in color.

2.5 INPUT AND OUTPUT CIRCUIT BREAKERS

2.5.1 General Information

This paragraph applies to the switchgear assemblies for 13.8 kV Input Circuit Breakers 767 and 777, and for Output Circuit Breaker 901. Except as otherwise specified or indicated, the design and construction of the metal-clad switchgear units, assemblies, and auxiliary compartments shall conform to applicable requirements of IEEE C37.20.2.

2.5.2 Housing

2.5.2.1 General

Each switchgear unit shall be enclosed in a self-supporting dead-front fabricated housing constructed of sheet metal on a rigid steel frame and provided with metal partitions or barriers as required. The sheet metal forming the enclosure for the removable element and the barriers between major primary sections shall not be less than No. 11 MSG. Exterior panel surfaces shall be free from holes, seams, dents, weld marks, loose scale, or other imperfections, and shall not be drilled or welded for attachment of wiring, resistors, or other devices where such holes or fastenings will be visible from the exterior. All ferrous fasteners shall have a rust-resistant finish, and all bolts and screws shall be provided with lock washers or other approved locking devices. Each switchgear unit shall be provided with a one-piece full-height door. The hinges for all doors shall be of the fully-concealed type. Stops shall be provided where required to limit door swing and prevent damage to hinges or adjacent equipment. The clearance between any edge of a hinged door, when closed, and the adjacent panel shall be uniform and shall not exceed 1/8-inch. Each door shall be supplied with a vault-type latch having key locking handles with identical keying and with two sets of keys furnished. Ventilating openings shall be provided as required for proper ventilation. The openings shall preferably be of the grille type and shall be provided with corrosion-resistant insect-proof screens on the inside. Provisions shall be made for top entry of conduits and cable trays as shown.

2.5.2.2 Construction

The housing for each removable circuit breaker element shall include a hinged front, separate three-phase bus, cable terminating compartments, primary and secondary disconnecting devices, automatic shutters, and mechanical interlocks. The stationary portions of the primary disconnecting devices and the circuit breaker removing mechanism shall be provided in the housing by the circuit breaker manufacturer. The housing structure and the removable element shall be self-aligning and shall be designed in such a manner as to ensure a good mechanical fit between the two and to permit the circuit breaker removable elements to be interchanged. The mechanism for removing the breaker shall provide for moving the circuit breaker from the operating to the disconnected or test positions. All contacts shall be silver-plated and shall have ample area and spring pressure. Contact parts which carry current shall not be used to supply contact-spring pressures. When the circuit breakers are withdrawn to the disconnect position, the circuit breaker bushing shall be withdrawn completely from the fixed contact enclosure and automatic shutters shall close the openings to prevent accidental contact with live terminals. All stationary secondary contacts shall be readily accessible and shall be adequately identified to facilitate connection with the control cables. When the circuit breaker is in the disconnect or test positions, it shall be operable from normal control sources by use of the set of control jumpers to be furnished with the "Accessories", or by other approved means, but shall not be operable from remote control stations.

2.5.2.3 Heaters

Each circuit breaker compartment shall be provided with strip heaters and a thermostat. The heaters shall be rated 150 volts minimum, single-phase, 60 Hz but will operate on a 120 volt ac supply. The number and capacity of heaters in each compartment shall be sufficient to provide 500 watts output when operating at 120 volts. The heaters and the thermostats shall be wired to terminal blocks within individual switchgear units and paralleled for two equally loaded circuits for external connections. The heaters shall be metal-enclosed and constructed of nickel chromium wire embedded in a high-grade

refractory material to ensure good insulation and rapid transfer of heat. Thermostats shall be adjustable through a minimum range of 60 degrees to 90 degrees F and minimum contact rating shall be 10 amperes at 120 volts ac. The heaters and thermostats shall be accessible for ease of inspection and maintenance.

2.5.3 Interlocks

Provisions shall be made for mechanical interlocks so that:

- a. The removable element cannot be removed from or placed in the operating position while the circuit breaker is in the closed position.
- b. The circuit breaker cannot be closed while the removable element is at any point between test and operating position.
- c. The circuit breaker cannot be closed unless the primary disconnecting devices are in full contact or separated by a safe distance.
- d. The removable element cannot be removed from the housing with the stored-energy operator in the charged position.
- e. Input Circuit Breakers 767 and 777 cannot both be closed, such that one breaker cannot close if the other is already closed.

2.5.4 Device Arrangement and Terminal Marking

The design of the switchgear and arrangement of devices shall be such that adequate space is allowed for inspection and maintenance of wiring, terminals and devices. Equipment on the rear of the panels shall be so mounted that the studs of the equipment mounted on the front of the panels will be accessible without removing any device. Each device mounted on or inside the switchgear shall be identified by a device designation marked on the device or on the panel adjacent to the device. These designations are in addition to the device identification nameplates located on the front panels. Where the manufacturer's standard device designations are different from the device designations shown on the Government schematic diagrams and device legends, the Government device designation shall also be marked on or adjacent to each device. Each terminal of each device to which a connection is made shall also be marked with a distinct terminal marking which corresponds with the terminal marking shown on the Contractor's schematic and connection diagrams. The device and terminal markings shall be of permanent legible printed form in a color which contrasts with the color of the device or panel and shall not be obscured by wires or other devices.

2.5.5 Wiring

Wiring shall be as described in Paragraph 2.1.3.

2.5.6 Channel Sill Foundations

Continuous channel sill foundations shall be utilized as recommended by the switchgear manufacturer for aligning and anchoring the switchgear to the concrete floor.

2.5.7 Grounding

Each switchgear assembly shall include a continuous interior copper bar ground bus to which the housing, framework, cable and bus supports, and non-current-carrying metallic parts of all equipment and conduits shall be grounded

insofar as practicable. Grounding shall conform to paragraph 7.2 of IEEE C37.20.2, except that the ground bus bar shall be not less than 1/4-inch by 1-inch in size. Ground connections shall be made by approved clamp-type fittings. No soldered connections shall be used in the leads. If the operating mechanism of removable units is not permanently grounded, ground contacts shall be provided to connect the movable element automatically to the ground buses. These connections shall make before the main disconnecting devices upon insertion, and break after the main disconnecting devices upon withdrawal. Splice plates shall be provided for bolted connections to existing switchgear ground bus. All contact surfaces between copper and aluminum shall be tinned or silver-plated. Multi-grip clamp-type cable terminals shall be provided where shown for connection to the station grounding system.

2.5.8 13.8 kV Circuit Breakers

2.5.8.1 Type and Rating

Each circuit breaker shall be electrically operated, metal-clad, with SF6 type interrupters, and suitable for indoor 60 Hz service. The circuit breakers shall be rated on a symmetrical current basis and shall have characteristics in accordance with Table 1 or Table A1 of ANSI C37.06 and as follows:

	<u>Table 1</u>	<u>Table A1</u>
a. Rated Maximum Voltage, kV	15	15
b. Rated Continuous Current, Amps	1200	1200
c. Rated Interrupting Time, cycles	5	5
d. Rated Short Circuit Current, Amps	40,000	--
e. Rated Short Circuit Current at Rated Max kV, Amps	--	28,000
f. Maximum Symmetrical Interrupting Capability, Amps	--	36,000
g. Closing and Latching Capability, Amps, Crest	104,000	97,000

Except as otherwise specified, the circuit breakers shall conform to the applicable requirements of the following Standards: IEEE C37.04, C37.11, C37.09, C37.100; ANSI C37.06; NEMA SG 4.

2.5.8.2 Removable Element

The removable element of each switchgear breaker unit shall consist of a 3-pole SF6 interrupter type circuit breaker, with an operating mechanism, primary and secondary disconnecting devices, low SF6 gas pressure alarm switches, auxiliary switches, operation counter, position indicator, and control wiring, all mounted on a rugged frame suitable for moving the element. Each of the 3 poles shall be an independently sealed SF6 type interrupter. The interrupter contacts shall be protected from moisture and contaminated atmosphere. Arc interruption shall be based on the SF6 single-pressure puffer principle. The interrupter shall be a low pressure device with the normal operating pressure not to exceed 2.5 bar gauge. SF6 low pressure alarm switches shall be provided for the alarm and trip circuits. Each interrupter shall have a contact wear indicator. If the frame is not equipped with

wheels, it shall be suitable for supporting and removing the element from the stationary housing by means of a special truck furnished with the accessories.

2.5.8.3 Interrupters

The SF6 interrupters shall be factory assembled and sealed, needing no interior maintenance or repairs to be performed after installation. The interrupters shall provide a minimum of 10,000 operations before replacement is needed. The interrupter shall have ready means of measuring contact wear. Each interrupter shall have a port for permanent connection of the switches. The low SF6 gas pressure switches shall be factory installed on the interrupters when replacement is needed. The SF6 gas enclosures shall contain materials to preserve the purity of the gas by scavenging undesirable arc by-products and other contaminants.

2.5.8.4 Sulfur Hexafluoride (SF6) Gas

2.5.8.4.1 Quality and Certification

All SF6 gas required to fill the circuit breakers to the proper operating pressures, the gas required for factory tests, and spare gas as specified in SPARE PARTS, shall be furnished. A material safety data sheet for the gas conforming to OSHA guidelines shall be included with the operating and maintenance manual. Prior to shipment of the circuit breakers, certification shall be submitted in duplicate that the gas furnished for the breakers will meet the requirements specified below.

2.5.8.4.2 Chemical, Physical and Electrical Characteristics

The insulating SF6 gas shall meet the requirements of ASTM D2472 except that the water content (maximum dew point), shall be minus 60° C with only 11 ppm water by volume and the minimum purity shall be 99.9 percent by weight. The Government, at point of delivery, may draw samples for testing to determine whether the SF6 gas meets the specifications. SF6 gas so tested and failing to meet the requirements will be removed and replaced by and at the expense of the Contractor.

2.5.8.5 Operating Mechanism

The circuit breakers shall be designed for normal operation by means of a motor-spring type, stored-energy closing operator with trip coil and shall also be provided with manual maintenance closing and emergency tripping devices. Manual maintenance closing shall include a slow closing feature. The operating mechanism shall be electrically and mechanically trip-free. The mechanism shall be removable without disturbing the alignment or adjustment of current-carrying parts of the circuit breakers. Each mechanism shall operate a position indicator which shall give positive indication of the contact position, whether closed or open. Each circuit breaker shall be equipped with an operation counter and an auxiliary switch assembly providing, in addition to the contacts shown and required for breaker control, not less than four electrically-independent single-pole contacts which can be changed readily to "circuit opening", or to "circuit closing", as required. Housing switches, for interlocking purposes, shall also be provided as indicated. Breaker closing time, when the breaker is operated from a control switch at rated control voltage, shall not exceed 15 cycles. The circuit breaker closing mechanism shall be so arranged that the closing speed of the contacts is independent of the control voltage. The stored-energy mechanism shall normally be charged by a small motor, but shall also have provisions for manually charging for emergency closing.

2.5.8.6 Control Equipment

All control equipment immediately associated with the circuit breaker operation shall be mounted directly on the circuit breaker assembly (or on the stationary structure) in a readily accessible location for testing and maintenance. The control equipment arrangement shall be such as to cut off the closing or tripping current as soon as the operation is completed and prevent pumping of the circuit breaker in case of automatic tripping or mechanical failure of any kind. Indicating lamps visible from the front with the door closed shall be supplied for each breaker to give a red indication for breaker closed position and a green indication for breaker open position. The red light shall be wired to give a continuous indication of trip circuit continuity when the breaker is closed. Each circuit breaker shall be provided with a local test control switch which shall be located within the housing and shall be effective only when the breaker is in the test or disconnected position. The control schemes shall incorporate all features indicated by the typical schematics shown. The Government will provide a 125 volt dc control source for breaker operation at each switchgear breaker. Each power circuit breaker shall be provided with one 2-pole molded-case air circuit breaker for disconnecting the breaker control source for the unit.

2.5.9 Buses

The primary buses for each switchgear assembly shall have a continuous current-carrying capacity of not less than 1,200 amperes, and shall have mechanical and thermal capacities coordinated with the highest momentary rating of the individual circuit breakers. Bus bars shall be of hard-drawn copper. Shop splices and tap connections shall be brazed, pressure-welded or bolted. All splices for field assembly shall be bolted. Where bolted connections are used, they shall be equipped with provisions for adequate clamping and contact surfaces shall be silver-plated. Each phase conductor shall be completely enclosed with molded insulation that will withstand the low frequency dielectric test specified in Section 5, paragraph 2. Molded or taped insulation of equivalent mechanical and electrical strength as that enclosing the bus shall be provided at bus joints. The buses with molded insulation shall be mounted on insulating supports, and shall pass through barriers between individual unit housings. Removable metal plates or bolted hinged doors at each unit housing shall be provided for access to the bus compartment.

2.5.10 Current Transformers

Current transformers, except as otherwise specified, shall conform to the applicable requirements of IEEE C37.20.2. They shall be of the dry or compound-insulated type and shall be provided with a suitable means of mounting and for grounding the frame. Each current transformer secondary lead shall be connected to a terminal block of the short-circuiting type and shall be conveniently located to permit short-circuiting the secondary windings without requiring access to the primary bus compartments. The polarity of the current transformers shall be plainly marked. Window or bushing type current transformers shall have minimum full-wave insulation level of 10 kV and, when installed, shall meet the requirements of 95 kV BIL class as listed in Table 2 of IEEE C57.13 for test voltage applied between the bus and transformer secondary terminals. All current transformers shall be suitable for continuous operation at the full rated voltage and current at a frequency of 60 Hz. All current transformers shall be designed to withstand, without damage, the thermal and mechanical stresses resulting from short circuit currents corresponding to ratings of the breakers in the circuits to which they are connected. The quantity, ratios, accuracies, and functions of the current transformers shall be as shown.

2.5.11 Air Circuit Breakers (Molded-Case Type)

2.5.11.1 General

Air circuit breakers shall conform to the applicable requirements of NEMA AB 3. The circuit breakers shall be manually operated and shall have trip free operating mechanisms of the quick-make, quick-break type. Commercial type circuit breakers similar to Westinghouse Quicklag or Siemens Type I-T-E EQ will not be acceptable. All poles of each breaker shall be operated simultaneously by means of a common handle, and shall be enclosed in a common molded plastic case. The contacts of multipole breakers shall open simultaneously when the breaker is opened. The operating handles shall clearly indicate whether the breakers are in "ON", or "OFF", or "Tripped" position. The circuit breakers shall be of the individually mounted, stationary type, shall be products of only one manufacturer, and shall be interchangeable when of the same frame size. Each circuit breaker shall be provided with mechanical pressure type terminal lugs as required. Where indicated, circuit breakers shall be provided with overcurrent type alarm contacts which close on automatic operation only. All alarm contacts shall be suitable for use on 125 volt dc ungrounded circuits. Manual reset of the breaker handle after an automatic trip shall reset the alarm contact.

2.5.11.2 Trip Units

The circuit breakers shall be of the automatic type with combination thermal inverse-time overload and instantaneous magnetic trip units. The instantaneous magnetic trip units shall be set at approximately ten times the continuous current rating of the circuit breaker. Air circuit breakers for 125 volt dc circuits shall be two-pole type rated 125/250 or 250 volts d.c., and shall have a minimum NEMA interrupting capacity of 5,000 amperes d.c. The minimum frame size shall be 100 amperes.

2.5.12 Control Switches

2.5.12.1 General

All control switches shall be of the rotary switchboard type with handles on the front and the operating contact mechanisms on the rear of the panels. Each switch shall be provided with ample contact stages including spare contacts where shown on the drawings to perform the functions of the control system. Contacts of all control switches shall be self-aligning and shall operate with a wiping action. A positive means of maintaining high pressure on closed contacts shall be provided. Compression springs or pivoted joints shall not be depended upon to carry current. The covers or plates on the switches shall be readily removable for inspection of contacts. All control switches shall be suitable for operation on 600 volt a.c. or 250 volt dc circuits, shall be capable of satisfactorily withstanding a life test of at least ten thousand operations with rated current flowing in the switch contacts, and shall be capable of continuously carrying 20 amperes without exceeding a temperature rise of 30 degrees C. The single-break inductive load interrupting ratings shall be not less than 1.5 amperes for 125 volts dc or 10 amperes for 120 volts ac. The circuit breaker control switches with the pullout feature shall be of the three-position momentary-contact type with spring-return-to-neutral position and shall have black pistol-grip handles. Mechanical operation indicators which show the last manual operation of the switch shall be provided.

2.5.12.2 Escutcheons and Nameplates

Each control switch shall be provided with an escutcheon clearly marked to show each operating position. The switch identifications shall be engraved on the escutcheon plates or on separate nameplates. The escutcheon and nameplate markings shall be subject to approval.

2.5.13 Indicating Lamp Assemblies

Indicating lamp assemblies shall be of the switchboard light-emitting diode type, insulated for 125 volt dc service, with appropriate colored caps and integrally-mounted resistors for 125 volt service. Lamps shall be designed for operation on 24 volts dc without external resistance. Color caps shall be made of material which will not be softened by the heat from the lamps. Lamps shall be replaceable from the front of the panels, and any special tools required for lamp replacement shall be furnished. Insofar as practicable, all color caps shall be similar and interchangeable, and all lamps shall be of the same type and rating.

2.5.14 Terminal Blocks

2.5.14.1 General

Terminal blocks for control wiring shall be molded or fabricated type with barriers, rated not less than 600 volts. The terminals shall be removable and of binding, fillister, or washer-head screw type, or stud type with contact and locking nuts. Each terminal shall be not less than No. 10 in size with length and space for connecting at least two indented terminal connectors for No. 19/22 AWG conductors to each terminal.

2.5.14.2 Terminal Blocks for Current Transformers

Short-circuiting type terminal blocks shall be furnished for all current transformer secondary leads and shall have provision for shorting together all leads from each current transformer without first opening any circuit.

2.5.14.3 Marking

White or other light-colored plastic marking strips, fastened by screws to each terminal block, shall be provided for wire designations. The manufacturer's wire number and the Government's wire number shall both be shown for each connected terminal on the marking strips with permanent marking fluid. The marking strips shall be reversible to permit marking both sides, or two marking strips shall be furnished with each block, to accommodate the two sets of wire numbers.

2.5.15 Nameplates

Whether specifically stated or not, each item of equipment, mounted on or in the switchgear, which does not have a suitable designation included as an integral part of the device shall be provided with an engraved nameplate or with other suitable means of approved identification. Nameplates shall be made of laminated sheet plastic or of anodized aluminum, approximately 1/8-inch thick, engraved to provide white letters on a black background. Equipment of the withdrawal type shall be provided with nameplates mounted on the removable equipment in locations visible when the equipment is in place. The nameplates shall be fastened to the panels in proper positions with black-finished roundhead screws. Each operating unit door or panel shall be provided with an identifying nameplate approximately 1 inch by 3 inches in size. Samples of engraved nameplates and a list of designations shall be submitted for approval. Nameplate designations shall be in accordance with the drawings. The Contractor will be permitted to supply and attach to the

end or back of the switchgear assembly a nameplate or trademark. A drawing or illustration showing the proposed nameplate, its size and location shall be submitted for approval.

2.5.16 Accessories

The Contractor shall furnish one complete set of handling and testing accessories for testing the removable elements of the metal-clad circuit breakers. A test cabinet shall be furnished and shall include all necessary secondary contacts, control relays, and control switches for simulating breaker operation. A molded-case air circuit breaker shall be provided in the cabinet to disconnect the incoming control source. The complete lot of accessories shall include:

- a. 1 - Test cabinet, as described above.
- b. 1 - Set of secondary couplers (if required).
- c. 1 - Closing lever for manually closing the breaker.
- d. 1 - Removable hand crank for operating the levering-in device.
- e. 1 - Special truck (if required).
- f. 1 - Complete set of all special wrenches and maintenance and repair of the equipment furnished under this section of the specification.
- g. 1 - Gallon of paint to exactly match the switchgear finish (quart containers).

2.5.17 Spare Parts

All spare parts shall be duplicates of the original parts furnished and interchangeable therewith. The following spare parts, with itemized prices, shall be furnished for each type and rating of device, except where parts are applicable for more than one type, in which case spare parts for only one unit are required:

- a. 1 - Complete removable element unit as described above.
- b. 3 - SF6 gas interrupters (1 set) for one three-pole breaker.
- c. 1 - Complete set of secondary disconnecting devices for one three-pole breaker.
- d. 1 - Solenoid of each type provided.
- e. 1 - Current transformer of each type and rating provided.
- f. 1 - Control relay of each type and rating provided.
- g. 1 - Rewinding motor and limit switches for the stored-energy mechanism.
- h. 1 - Auxiliary switch, complete.
- i. 3 - Low SF6 gas-pressure alarm switch.
- j. 6 - Primary disconnect assemblies.

k. 2 - Switchboard light-emitting diode indicating lamp of each type provided.

l. 1 - Lot of spare fuses of each type and rating provided.

m. 1 - Lot of spare terminal block marking strips (one spare strip for each five terminal blocks of each size provided).

n. 1 - Lot of SF6 gas sufficient to fully charge one circuit breaker. Bottle shall become the property of the Government.

2.6 CURRENT-LIMITING REACTORS

2.6.1 General

Provide a total of six (6) dry-type air-core single-phase current-limiting reactors with the characteristics specified herein, complete with enclosures, support pedestals and insulators. Reactors shall be fabricated by a company that has had a minimum of three years experience in building reactors. The reactors shall be used to limit the available system fault current to the Input Circuit Breakers 767 and 777. Short circuit available ahead of the reactors is calculated to be 86.4 kA momentary and 50.7 kA interrupting, three-phase symmetrical. The reactors shall limit fault current to 20 kA three-phase symmetrical.

2.6.2 Configuration

Configuration of the six reactors will be two each three-phase banks, with each bank in a common indoor enclosure. Reactors shall be suitable for installation within the space limitations shown. Input shall be 1,200 amp isolated-phase bus entering the top of each phase enclosure. Flexible links may be used as approved to connect the isolated phase bus conductor to the reactor input terminals. Output lugs shall be provided for two 350 kcmil 15 kV shielded copper cables per phase. The output cables and two 4-inch output conduits per bank will be by others. Each reactor bank enclosure shall provide for top entry of these two output conduits at one central point.

2.6.3 Ratings

Unless otherwise approved, ratings shall be as follows:

a. System voltage, kV, rms.....	15
b. Frequency, Hz.....	60
c. Continuous current, amperes, rms.....	700
d. Impedance, ohms.....	0.25
e. Short current (thermal), kA rms @ 3.0 seconds.....	20
f. Impulse withstand voltage, full-wave, kV, (BIL) crest.....	110
g. Maximum voltage drop (per phase).....	3.6%

Continuous current rating and impedance rating exceeding those shown may be submitted for approval in order to use standard configurations from the manufacturer's product line, if available.

2.6.4 Construction

The reactors shall be designed and constructed in accordance with the applicable provisions on IEEE C57.16 with the additions specified herein. Reactor conductors shall be multi-strand aluminum or copper, using a cross-linked polyethylene insulation. Aluminum is acceptable, unless copper is required for the manufacturer to provide the specified ratings within the space limitations shown. Shunt arresters or shunt resistors shall not be used. Contact surfaces for bolted connections on lugs shall be silver plated. Average temperature rise of each phase during continuous rated full load shall not exceed 65 degrees C above 40 degree C ambient temperature. Type TR225 or similar insulator supports for the reactors shall be provided. Reactors shall be constructed to avoid excessive induced heating of each other and of the structural reinforcing steel in the concrete floor and surrounding concrete walls, either under normal operation or fault conditions, when installed as shown.

2.7 ISOLATED-PHASE BUS

2.7.1 Application

The electrical connections between the existing power transformer isolated-phase bus and the new current-limiting reactors shall be fabricated in sections to suit the general arrangement indicated on the contract drawings. The drawings are intended to indicate the limitations of space in which each bus structure is to be installed and the desired arrangement of bus connections.

2.7.2 General

The bus structures shall conform to the applicable requirements of NEMA SG5 and IEEE C37.23. Housing for the bus conductors shall be constructed of sheet metal, not less than 1/8-inch thick or No. 11 MSG. Bus conductors shall be of aluminum bars or shapes. All splices in aluminum bus for shop and field assembly shall be welded. Welding shall conform to AWS D1.1, AWS D1.2, and AWS D10.7. Welders shall meet the requirements of AWS QC1 unless otherwise noted.

2.7.3 Connections

Bolted connections on aluminum buses shall be permitted only where the buses terminate at the current-limiting reactors or at disconnecting links, unless otherwise approved by the COR. Where bolted connections occur, they shall be accessible for maintenance, the contact surfaces shall be silver plated and the connections shall be made with high strength bolts, thick washers or pressure plates and Belleville-style washers. Spring lock washers will be acceptable in lieu of Belleville-style washers if utilized in the manufacturer's proven design and specifically approved by the COR. Torque specifications shall be furnished for all bolts at bolted connections and shall be indicated on the shop drawings. Detail drawings of each size and type of joint, together with sufficient data or calculations to evaluate the joint, shall be submitted. Silver plating of all contact surfaces on aluminum buses shall be accomplished so as to obtain a uniform deposit of permanently bonded silver. Thickness of the plating shall be sufficient to permit repeated disassembly and reassembly of the bolted connections without causing the connections to exceed their rated temperature rise. Unless otherwise approved, the silver plating method shall conform to ASTM B253. Each connection or splice shall be so constructed that there will be no objectionable electrolytic effects.

2.7.4 Bus Structure

Bus sections shall be as long as is practicable to manufacture and install so as to minimize the number of field joints. The design of the enclosures shall be such as to facilitate the installation and alignment of all bus sections and the completion of field joints in the bus conductors before the structures are completely closed. All hangers and supports and ancillary hardware required for mounting the bus structures shall be supplied by the Contractor. Recommended method of anchoring, with size and quantity of bolts, shall be shown on the Contractor's drawings. Ceiling supported hanger rods shall contain at least two inches of threaded length for anchoring. Supporting structures for indoor application shall be finished to match the bus, and all associated ferrous fasteners shall have a rust-resistant finish. Outside supporting members which are not an integral part of the bus enclosure and all associated ferrous fasteners shall be galvanized. The outdoor sections of the bus enclosures shall be painted sky gray finish ANSI No. 70 and indoor sections light gray ANSI No. 61.

2.7.5 Construction

Nonmagnetic mounting framework and low resistance shielding bands shall be used where necessary to meet temperature rise limitations. Each conductor shall be anchored as required to control the direction of its movement due to heating and prevent creepage. Adequate provision shall be made for expansion and contraction caused by temperatures variations in the powerhouse based on a 40°C ambient. Expansion joints in the bus conductors shall be of a type which do not require sliding contacts. The bus conductor supports shall be one-piece porcelain insulators so arranged as to permit the conductor as much free movement, except at anchor points, as will be caused by temperature changes. Seal-off bushings shall be provided at the new current-limiting reactors. Filter-type drain plugs shall be provided where required to avoid accumulation of condensation. The number of housing joints shall be kept to a minimum. Joints for field assembly shall be of bolted, clamped, or welded construction, designed to be watertight. If designed for field welding, the joints shall have special provisions for maintaining alignment during the welding process. Removable plates or other means approved by the COR shall be provided to permit access for bus inspection. The bus structures shall be designed and fabricated such that after installation, all bolted connections are accessible for maintenance and all inspection plates are accessible. The bus structures shall be designed for bolting to the current-limiting reactor housings. Where flexible connectors are bolted to the bus or to equipment terminals, Belleville-style washers and nonmagnetic stainless steel washer plates shall be used to maintain pressure on the connectors. Each bus structure housing shall be so arranged that a rupture of any one housing will not open an air path from one phase conductor to another. All sections of the different phases of the bus housings shall be electrically interconnected or mechanically bonded together to allow free circulation of currents in the housings caused by induced voltages, thereby avoiding the necessity of special treatment to minimize inductive heating of reinforcing steel in wall and ceilings, supporting frames, conduits, or other proximate steel.

2.7.6 Ratings

The bus shall be capable of transmitting continuously at a rated voltage of 14.4 kV and 110 kV BIL, a minimum of 1,200 amperes, without injury to any part of the bus structure and without bus conductors exceeding a maximum temperature rise of 65°C above a 40°C ambient or without accessible bus enclosures exceeding a maximum temperature rise of 40°C above a 40°C ambient. Sufficient conductor material shall be used at bus terminal points so that temperature rise of bolted connections at the generator circuit breakers will not exceed 55°C above a 40°C ambient. Buses with higher current ratings may

be furnished if desired, subject to the approval of the COR. The asymmetrical momentary current rating of the isolated phase buses shall not be less than 115,000 rms amperes. The coordinated design of the buses, connections, and structural supports shall be such that the completed assemblies can safely withstand the maximum mechanical forces and thermal effects of a short circuit of the above value.

2.7.7 Grounding

Bus housing sections shall be bonded together to form an electrically continuous type enclosure with provisions for connection to the powerhouse ground system. Provisions and locations shall be shown on the Contractor's drawings. The proposed method of grounding shall be subject to the approval of the COR. Multigrip clamp type terminals shall be provided for connecting 500 kcmil copper ground cable. Contact surfaces at points of attachment of terminals shall be silver-plated.

2.7.8 Disconnecting Links

Disconnecting bus links with bolted, silver-plated joints, and bolted access panel openings in the housings shall be placed in each phase of the isolated-phase bus at the current-limiting reactors. The disconnecting links will permit disconnecting the current-limiting reactors from the power transformer bus, and shall be readily accessible for removal. The disconnecting links shall utilize flexible copper braid conductors, four per phase rated 1,000 amperes each for 4,000 amp bus, and five per phase rated 1,000 amperes each for 5,000 amp bus, unless otherwise approved by the COR, and shall include all hardware for connections.

2.7.9 Welding

All welding shall be performed by the electric-arc method, by a process which will exclude air from the molten metal and, where practicable, under procedure control using automatic machines. The design and construction of welded joints shall conform to the requirements of ASME BPV VIII or to AWS D1.1 as applicable. After being deposited, welds shall be cleaned by shot-blasting unless otherwise approved, and shall show uniform sections, smoothness of weld metal, feather-edges without overlap, and freedom from porosity and inclusions. Visual inspection at the edges and ends of welds shall indicate complete fusion with the base metal. Particular care shall be taken in aligning and separating the edges of members to be joined by butt welding, so that complete penetration and fusion for the full depth of the joint will be assured. All pinholes, cracks, and other defects shall be repaired by chipping or grinding the defect to sound metal and rewelding. Where fillet welds are used, the members shall fit closely and shall be held together during welding. The welding rods used for manual welding shall be suitable for the position in which the welding is performed.

3.0 EXECUTION

3.1 STATIC FREQUENCY CONVERTER INSPECTION AND TESTS

3.1.1 General

All components and completed equipment shall be given the Manufacturer's standard production tests to verify performance in accordance with this specification. The Contractor shall provide certified test reports for tests performed on the static frequency converter. The Government shall at any reasonable time be permitted to have his representatives visit the

Contractor's factory, for the purpose of examining the equipment to ascertain that the materials and processes used in its manufacture and factory testing conform to this specification. The Contractor shall submit an outline of the factory tests which will be performed on the equipment and provide the Government a notice of 60 days before the factory tests are performed so the Government's representatives can witness the tests.

3.1.2 Inspections and Tests

The inspections and tests listed as follows are required as a minimum if these tests are not part of the manufacturer's standard tests:

a. Voltage and Insulation Test. Dielectric tests shall be performed to verify the insulation adequacy between wiring and ground for the following circuits as a minimum:

- (1) AC high voltage circuit.
- (2) AC auxiliary power distribution (480v. and 120v).
- (3) DC control power distribution (125v. DC).
- (4) PT and CT secondary circuits.
- (5) Input and Output control circuits.
- (6) DC elementary power distribution circuits.

b. Measure Heatsink Interface Voltages at all interfaces of a converter part with a DC measuring current.

c. Check of Correct Settings. Check all adjustable settings in accordance with the documents in the operation and maintenance manual.

d. Functional Test. By simulating the input values, the function of each Unit or of groups of Units listed below shall be tested to verify the detail function of single Units or the overall function of groups of Units and of the whole converter:

- (1) Check of correct AC and DC auxiliaries power supply distribution.
- (2) Check operation of fans.
- (3) Checks of electronic power supply distribution.
- (4) Check interfaces to the control and protection circuits.
- (5) Check monitoring system.
- (6) Check gate control unit, power stages and gate impulses on the machine side.
- (7) Check function curves in controller.
- (8) Check current controller.
- (9) Check speed controller.
- (10) Check local operation.
- (11) Perform overall functional light-load test of converter with High Voltage applied to the converter.
- (12) Check Quality Records for completeness.

e. Heat run test at rated load.

3.1.3 Field Tests

Instrument blocking and other protection for delicate mechanisms installed for shipment and handling shall be removed just prior to testing. Operational testing of the static frequency control system, including indication and annunciation devices, shall be performed by the Contractor under Government witness to validate performance of the intended equipment and system functions. The Contractor shall submit complete tests procedures for

Contracting Officer approval. The static frequency control system shall be thoroughly checked for proper operation and shall verify that all necessary adjustments have been made. The testing shall verify the following operation:

a. The static starting equipment shall break the motor away from a dead stop. At synchronous speed, the static starter shall synchronize the motor to the system bus.

b. The static starting equipment shall accelerate and synchronize any one (1) of the four (4) motors over an input voltage range of 13.8 kilovolts plus or minus 5 percent and frequency range of 60 plus or minus 0.1 hertz. in a minimum amount of time (not to exceed five minutes).

c. The starter shall be capable of five (5) unit starts per hour without exceeding its temperature rise limitations.

d. Ambient operating temperature of all equipment shall not exceed 40 degrees C.

3.1.3.1 Test Reports

The Contractor shall furnish five certified copies of the reports of all field tests including complete test data. Test reports of all witnessed tests shall be signed by the witnessing representatives of the Contractor and the Contracting Officer. Reports shall as a minimum include the following:

- a. purpose
- b. procedure used
- c. collected data
- d. results
- e. date and time tests were performed
- f. test engineer's name, title, and signature
- g. Government witness's name, title, and signature

3.2 INPUT AND OUTPUT TRANSFORMER TESTS

3.2.1 Factory Tests

The first dry type power potential transformer shipped shall receive routine, design and other tests in accordance with IEEE standard C57.12.01, Table 15. The next dry type transformer shipped shall receive the routine test only in accordance with IEEE standard C57.12.01, Table 15. These tests are listed below.

ROUTINE (All transformers)

Resistance measurements
Ratio
Polarity and Phase Relation
No-Load Losses and Excitation Current
Impedance Voltage and Load Loss
Dielectric Tests (Applied Voltage and Induced Voltage)

DESIGN and OTHER (First transformer)

Temperature Rise
Dielectric Tests (Impulse; Insulation Power Factor; and Insulation Resistance)
Audible Sound Level

3.2.2 Corps of Engineers Tests

The Corps of Engineers personnel will Doble test all transformers at the site on the primary and secondary side prior to final connection of the primary and secondary leads.

3.2.3 Test Data

Factory test data and results on each power potential transformer shall be furnished to the Government before shipment of the transformers to the powerhouse.

3.3 INPUT AND OUTPUT CIRCUIT BREAKER INSPECTION AND TESTS

3.3.1 Nameplates and Markings

Whether specifically stated or not, each item of equipment, mounted on or in the equipment, which does not have a suitable designation included as an integral part of the device shall be provided with an engraved nameplate. Nameplate designations shall be in accordance with the drawings and shall be submitted for the approval of the Contracting Officer.

3.3.2 Device Markings

Each device mounted on or inside the equipment shall be identified by a device designation marked on the device or on the panel adjacent to the device. These designations are in addition to the device identification nameplates located on the front panels. Where the manufacturer's standard device designations are different from the device designations shown on the Government schematic diagrams and device legends, the Government device designation shall also be marked on or adjacent to each device. Each terminal of each device to which a connection is made shall also be marked with a distinct terminal marking which corresponds with the terminal marking shown on the Contractor's schematic and connection diagrams. The device and terminal markings shall be of permanent legible printed form in a color which contrasts with the color of the device or panel and shall not be obscured by wires or other devices.

3.3.3 Terminal Block Markings

Terminal block wire designations shall be made with white or other light-colored plastic marking strips, fastened by screws. For each connected terminal, the manufacturer's wire number and Government's wire number shall both be shown on the marking strips with permanent marking fluid. The marking strips shall be reversible to permit marking both sides, or two marking strips shall be furnished with each block, to accommodate the two sets of wire numbers.

3.3.4 Wire Markings

All control conductors shall be identified with nonmetallic tube-type markers at each termination. Markers shall be suitable for the type of wire insulation. Tubing shall be sized to fit the wire being marked and shall have black marking on a light colored background. Installed markers shall be uniform in position on the wire and legends shall be visible when wires are

terminated on blocks or at equipment. Written certification from an approved independent testing laboratory shall be furnished to indicate that the markers will not stain or discolor after 20 years' service when subjected to an accelerated aging test while in contact with wire insulating materials. Identification on markers shall be as shown on the shop drawings or as directed.

3.3.5 Painting

Interior and exterior steel surfaces of the equipment housing shall be thoroughly cleaned by sandblasting, pickling and rinsing, or other means, and then receive a rust-inhibitive phosphatizing or equivalent treatment prior to painting in accordance with IEEE C37.20.2 requirements. Exterior surfaces shall be free from holes, seams, dents, weld marks, loose scale or other imperfections. Interior surfaces shall receive not less than one coat of corrosion-resisting paint in accordance with the manufacturer's standard practice. Exterior surfaces shall be primed, filled where necessary, and given not less than two coats of quick air-drying lacquer or synthetic enamel with semi-gloss finish, ANSI Indoor Light Gray No. 61 in color. Lead-based paints shall not be used. Spare paint shall be furnished to repair any damage in the exterior finish after the equipment has been installed.

3.3.6 Shipment and Packaging

Each separate metal-clad circuit breaker unit and auxiliary compartment shall be completely assembled and wired at the factory. Terminal blocks and internal wiring shall be provided to all breaker spare auxiliary contacts and control device spare contacts for the connection of remote circuits. After complete assembly, the switchgear shall be disassembled into sections for convenience of handling, shipment, and installation in the powerhouse. The switchgear equipment shall be shipped as completely assembled and wired as feasible so as to require a minimum of installation work at the powerhouse. Any instrument, relay, meter, or other device which cannot withstand the hazards of shipment when mounted in place shall be carefully packed and shipped separately. These devices shall be marked with the numbers of the panels on which they are to be mounted and shall be clearly identified so that they can be readily mounted and connected. Equipment which is disassembled into sections for shipment shall have the associated parts properly match-marked to facilitate installation. Each shipping section shall be properly match-marked to facilitate reassembly, and shall be provided with removable lifting channels with eye bolts for attachment of crane slings to facilitate lifting and handling. Finished painted surfaces and metal work shall be wrapped suitably or otherwise adequately protected from damage during shipment. Parts shall be prepared for shipment so that slings for handling may be attached readily while the parts are in the railway car or truck. Equipment crated for shipment shall be of such size, including crates, that will pass through a 9'-0" by 9'-3" hatch opening, and a 5'-0" wide by 6'-9" high door opening. The Contractor shall investigate and verify openings and routing through which equipment and packaging must pass at the installation site. Equipment shipping container sizes and proposed routing shall be submitted to the Contracting Officer for approval. The new switchgear shall be transported and handled as packaged by the manufacturer. Crating and other packing shall not be removed until the equipment is adjacent to and ready to be mounted in its permanent location.

3.3.7 Factory Inspection And Tests

Each item of equipment supplied under this contract shall be given the manufacturer's routine factory tests and other tests specified below to ensure successful operation of all parts of the assemblies. The factory test equipment and the test methods used shall conform to the applicable

requirements of ANSI Standards, IEEE Standards, and NEMA Publications and shall be subject to the approval of the Contracting Officer. All tests required shall be witnessed by the Contracting Officer unless waived in writing, and no equipment shall be shipped until it has been approved for shipment by the Contracting Officer. The Contractor shall notify the Contracting Officer a minimum of 2 weeks in advance of the date of the tests so that arrangements can be made for the Contracting Officer to be present at the tests.

3.3.7.1 Switchgear Design Tests

Applicable design tests in accordance with section 5.2 of IEEE C37.20.3 shall be performed to demonstrate the adequacy of the design unless performed previously on a representative model with the same basic design. These tests will not be required if satisfactory design tests have previously been made on metal-clad switchgear of the same design, construction and rating as that specified, in which case, the Contractor shall furnish certified copies of these tests to prove adequacy of design. The requirements for these tests will then be waived, and the cost will not be included in the contract.

3.3.7.2 Circuit Breaker and Switchgear Production Tests

The metalclad circuit breaker switchgear assemblies shall be subjected to production line tests in accordance with IEEE C37.20.2, paragraph 5.3, in addition to all other routine production tests regularly made by the manufacturer. Window or bushing type current transformers and associated switchgear buses shall be included in the dielectric test. In addition each power circuit breaker in the switchgear assembly shall have been subjected to the following tests:

a. Dry one-minute, low-frequency, withstand dielectric test of 36 kV in conformance with IEEE C37.09, paragraph 5.16.

b. At least 10 Close-Open operations at each of 3 control voltages; minimum, rated, and maximum, corresponding to the ANSI range of control voltages. Each circuit breaker shall be thoroughly checked for proper operation and all necessary adjustments shall be made.

3.3.7.3 Current Transformer Tests

The current transformers shall be subjected to routine tests in accordance with paragraph 4.7.2 of IEEE C57.13 including a dielectric withstand test of 2,500 volts to ground for one minute on each secondary winding. Low-frequency applied-potential dielectric tests between windings and between windings and ground shall be done for wound- and bar-type current transformers. Each current transformer to be used for other than relaying shall be given special ratio and phase angle tests at secondary currents of 0.5, 1, 2, 3, and 5 amperes, 60 Hz, and burdens of B0.1, B0.5, and B2, in accordance with IEEE C57.13. The Contractor shall also provide typical ratio and phase angle curves for each type and rating of current transformer provided with the equipment.

3.3.8 Drawings

All drawings and data submitted and approved will form a part of the contract. The submission sequence of drawings shall be such that all information is available for checking each drawing when it is received. Drawing details and notes shall be of such quality and clarity and of sufficient definition and line weight so as to permit sharp and totally legible microfilming. If the submitted drawings show variations from the contract requirements, the variations shall be described in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any variations, an

appropriate contract modification shall be issued, except that, if the variation is minor and does not involve a change in price or in time of performance, a modification need not be issued.

3.3.8.1 Outline Drawings

Outline drawings of all equipment to be furnished under the contract, together with final weights of the equipment and overall dimensions, shall be submitted for the approval of the Contracting Officer. Other drawings and data concerning the overall equipment arrangement and installation details of the replacement/retrofit circuit breakers, bus, and appurtenances shall also be submitted for approval.

3.3.8.2 Schematic Diagrams

Schematic diagrams shall show all new devices and existing devices. The schematic diagrams shall indicate which devices are local to the circuit breaker and which devices are located in the Control Room. The diagrams shall, also, differentiate between new devices and existing devices.

3.3.8.3 Wiring diagrams

Wiring diagrams shall be made as seen by an observer of the actual equipment arrangement, and space shall be provided for addition of future devices where mounting space exists on the structure.

3.3.9 Field Tests

Instrument blocking and other protection for delicate mechanisms installed for shipment and handling shall be removed just prior to testing. Operational testing of the circuit breakers, switches, relays, and other control, indication and annunciation devices shall be performed by the Contractor under Government witness to validate performance of the intended equipment and system functions. The Contractor shall submit complete tests procedures for Contracting Officer approval. The circuit breaker field tests shall conform with IEEE C37.09. Each circuit breaker shall be thoroughly checked for proper operation and shall verify that all necessary adjustments have been made.

3.3.9.1 Test Reports

The Contractor shall furnish five certified copies of the reports of all field tests including complete test data. Test reports of all witnessed tests shall be signed by the witnessing representatives of the Contractor and the Contracting Officer. Reports shall as a minimum include the following:

- a. purpose
- b. procedure used
- c. collected data
- d. results
- e. date and time tests were performed
- f. test engineer's name, title, and signature
- g. Government witness's name, title, and signature

3.3.10 As-Built Drawings

The Contractor or his subcontractor shall submit new final (as-built) wiring diagrams and control schematics for each circuit breaker. As-Built Drawings shall show all wiring as left after completion of the Contractor's work. Drawings and CAD files shall be in accordance with SECTION 01307.

3.3.11 Operation And Maintenance (O & M) Manuals

The Contractor shall submit O & M Manuals with parts catalogs in accordance with SECTION 01306. In addition, each O & M Manual shall contain a copy of all warranties and a list of local service representatives. If after field testing the manuals require revisions, they shall be updated and resubmitted for approval within 10 calendar days after completion of the tests. The O & M Manuals shall be shown as a separate activity on the Contractor prepared construction schedule bar chart or network analysis system. Parts catalogs, where applicable, and operating instructions especially prepared covering all equipment furnished under this contract which may be needed or useful in operation, maintenance, repairs, dismantling, or assembling, and for repair and identification of parts for ordering replacements shall be assembled under a suitable common cover. The assembled material shall include complete identification of the spare parts furnished in compliance with the requirements of these specifications.

3.3.12 Contractor-Furnished Training of Government Personnel

The Contractor shall conduct a course in the theory, operation, and maintenance of the new circuit breakers. The course shall be 4 hours minimum duration for approximately 10 Government personnel at the Project and shall include training documents for all materials covered. The Contractor-furnished training of Government Personnel shall include system design and operations, routine maintenance requirements, trouble-shooting, and the method (procedure) for ordering replacement parts. The Government may videotape the training sessions for future use by the Government. Training shall be scheduled prior to acceptance of the field tests.

3.4 CURRENT-LIMITING REACTOR TESTS

Two certified copies of the following test reports, performed in accordance with the requirements of IEEE C57.16 shall be submitted for approval: dielectric tests, impedance and loss tests, temperature rise tests, short circuit and mechanical strength tests. The Government shall be notified 30 days in advance prior to testing. Two copies of other factory test results that are routinely performed by the manufacturer shall be submitted for information prior to shipment. For destructive tests, type tests that have been made on reactors of identical manufacture and ratings may be submitted for approval.

3.5 ISOLATED-PHASE BUS TESTS

The metal-enclosed buses shall be subjected to tests in accordance with IEEE C37.23. Each shop assembled section of the bus shall be given a 1-minute power frequency dry withstand dielectric test between all three conductors connected together and the grounded metal housing. Representative sections of the bus shall be tested if the tests specified below have not been made previously. These tests will not be required if satisfactory tests have previously been made on metal enclosed buses of the same design, construction, and rating as that specified, in which case the Contractor shall furnish certified copies of these tests to prove adequacy of design. Tests shall be as follows:

- a. Impulse Withstand Test (full-wave)
- b. Temperature Rise Test
- c. Momentary Current Test

3.6 TRAINING

3.6.1 General

The Contractor shall provide on-site training for operation and maintenance of the static frequency converter, as well as training for the Input and Output Circuit Breakers as described in paragraph 3.3.12. The training shall be performed by qualified instructors knowledgeable in the specific design, construction, operation, and maintenance of the static starter. Instructors shall be regular employees of the static frequency converter manufacturer. Detailed instruction manuals shall be provided for each person in the class (maximum of 10 students). Training shall take place immediately after the static frequency converter has been tested and placed into service by the Contractor. All class material and instructions shall be in English. The class shall take place during normal working hours (7:30 a.m. to 4 p.m., Eastern time), Monday through Friday. The Contractor shall inform the Contracting Officer at least 10 days prior to scheduling the training class.

The Government reserves the right to video tape any part or all of the training for future in-house use.

3.6.2 Operation Training

Operational training for the static starter shall include hands-on operation of the starter and shall train the operators in all modes of operation.

3.6.3 Maintenance Training

Maintenance training for the static starter shall include hands-on maintenance and shall train maintenance personnel in all electrical, electronic, and mechanical maintenance procedures, including servicing and repair of electronic components. Any special tools shall be provided and their use demonstrated. Each test, maintenance, and repair procedure shall be documented and thoroughly explained during the training.

3.6.4 Hardware and Software Training

A separate, special training session shall be included for programming of the computer-based control system components. Training shall include a complete description of control philosophy, training on programming of the logic controller, and special troubleshooting and maintenance techniques. The use of programming tools and/or software shall be demonstrated. Duration of the training session shall be as required, but not less than 3 days for 3 plant personnel.

3.6.5 Duration

The training shall consist of one session of each type of training in subparagraphs 3.6.2 and 3.6.3 above. Each session shall be of appropriate length to thoroughly cover the subject material, but shall not be less than 8 hours for each type.

LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

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2. INSTRUCTIONS FOR COMPLETING DD FORM 1423
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5. DRAWINGS: See Index of Drawings on Plate No. G-1.

EXHIBITS A AND B

ADDRESS AND CODE

1. Where the following office symbols are shown in Block 14 the material shall be addressed as shown:

Symbol	Address
(1) CESAS-CT-P	Department of the Army Savannah District, U.S. Army Corps of Engineers ATTN: CESAS-CT-P P.O. Box 889 Savannah, GA 31402-0889
(2) CESAS-CD-RR	Department of the Army Savannah District, Russell Area Office ATTN: CESAS-CD-RR, Tom List 2167 Engineer Drive Elberton, GA 30365
(3) CENWP-HDC-A	Department of the Army Portland District, Corps of Engineers ATTN: CENWP-HDC-A, Bob Schofield/Jonathan Fant P.O. Box 2947 Portland, OR 97208-2946

2. The codes used are defined as follows:

<u>Code</u>	<u>Block</u>	<u>Definition</u>
(1) OTIME	10	One time.
(2) XX	7	Inspection and acceptance requirements specified elsewhere in contract.
(3) A	8	Requires specific approval.
(4) ONE/R	10	One time plus revisions.
(5) DAC	12	Days after receipt of contract.
(6) DAR	13	Days after receipt of drawings APPROVED AS NOTED or RETURNED FOR CORRECTION.
(7) DBD	13	Days before delivery.
(8) ASREQ	10,11,12	As required.
(9) MTHLY	10	Monthly.
(10) O	11	Submit on last day of the month.

CLAUSES INCORPORATED BY FULL TEXT

52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)

(a) Definitions. As used in this clause--

“Postconsumer material” means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of “recovered material.” For paper and paper products, postconsumer material means “postconsumer fiber” defined by the U.S. Environmental Protection Agency (EPA) as--

(1) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; or

(2) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste; but not

(3) Fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

“Printed or copied double-sided” means printing or reproducing a document so that information is on both sides of a sheet of paper.

“Recovered material,” for paper and paper products, is defined by EPA in its Comprehensive Procurement Guideline as “recovered fiber” and means the following materials:

(1) Postconsumer fiber; and

(2) Manufacturing wastes such as--

(i) Dry paper and paperboard waste generated after completion of the papermaking process (that is, those manufacturing operations up to and including the cutting and trimming of the paper machine reel into smaller rolls or rough sheets) including: envelope cuttings, bindery trimmings, and other paper and paperboard waste resulting from printing, cutting, forming, and other converting operations; bag, box, and carton manufacturing wastes; and butt rolls, mill wrappers, and rejected unused stock; and

(ii) Repulped finished paper and paperboard from obsolete inventories of paper and paperboard manufacturers, merchants, wholesalers, dealers, printers, converters, or others.

(b) In accordance with Section 101 of Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition, the Contractor is encouraged to submit paper documents, such as offers, letters, or reports, that are printed or copied double-sided on recycled paper that meet minimum content standards specified in Section 505 of Executive Order 13101, when not using electronic commerce methods to submit information or data to the Government.

(c) If the Contractor cannot purchase high-speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock meeting the 30 percent postconsumer material standard for use in submitting paper documents to the Government, it should use paper containing no less than 20 percent postconsumer material. This lesser standard should be used only when paper meeting the 30 percent postconsumer material standard is not obtainable at a reasonable price or does not meet reasonable performance standards.

(End of clause)

52.204-6 DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUN 99)

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" followed by the DUNS number that identifies the offeror's name and address exactly as stated in the offer.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one. A DUNS number will be provided immediately by telephone at no charge to the offeror. For information on obtaining a DUNS number, the offeror, if located within the United States, should call Dun and Bradstreet at 1-800-333-0505. The offeror should be prepared to provide the following information:

- (1) Company name.
- (2) Company address.
- (3) Company telephone number.
- (4) Line of business.
- (5) Chief executive officer/key manager.
- (6) Date the company was started.
- (7) Number of people employed by the company.
- (8) Company affiliation.

(c) Offerors located outside the United States may obtain the location and phone number of the local Dun and Bradstreet Information Services office from the Internet Home Page at <http://www.customerservice@dnb.com>. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@mail.dnb.com.

(End of provision)

52.211-17 DELIVERY OF EXCESS QUANTITIES (SEP 1989)

The Contractor is responsible for the delivery of each item quantity within allowable variations, if any. If the Contractor delivers and the Government receives quantities of any item in excess of the quantity called for (after considering any allowable variation in quantity), such excess quantities will be treated as being delivered for the convenience of the Contractor. The Government may retain such excess quantities up to \$250 in value without compensating the Contractor therefor, and the Contractor waives all right, title, or interests therein. Quantities in excess of \$250 will, at the option of the Government, either be returned at the Contractor's expense or retained and paid for by the Government at the contract unit price.

52.212-4 CONTRACT TERMS AND CONDITIONS-- COMMERCIAL ITEMS (FEB 2002)

(a) Inspection/Acceptance. The Contractor shall only tender for acceptance those items that conform to the requirements of this contract. The Government reserves the right to inspect or test any supplies or services that have been tendered for acceptance. The Government may require repair or replacement of nonconforming supplies or reperformance of nonconforming services at no increase in contract price. The Government must exercise its post-acceptance rights (1) within a reasonable time after the defect was discovered or should have been discovered; and (2) before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.

(b) Assignment. The Contractor or its assignee may assign its rights to receive payment due as a result of performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency in accordance with the Assignment of Claims Act (31 U.S.C. 3727). However, when a third party makes payment (e.g., use of the Governmentwide commercial purchase card), the Contractor may not assign its rights to receive payment under this contract.

(c) Changes. Changes in the terms and conditions of this contract may be made only by written agreement of the parties.

(d) Disputes. This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613). Failure of the parties to this contract to reach agreement on any request for equitable adjustment, claim, appeal or action arising under or relating to this contract shall be a dispute to be resolved in accordance with the clause at FAR 52.233-1, Disputes, which is incorporated herein by reference. The Contractor shall proceed diligently with performance of this contract, pending final resolution of any dispute arising under the contract.

(e) Definitions. The clause at FAR 52.202-1, Definitions, is incorporated herein by reference.

(f) Excusable delays. The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence such as, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement or any excusable delay, setting for the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence.

(g) Invoice. The Contractor shall submit an original invoice and three copies (or electronic invoice, if authorized,) to the address designated in the contract to receive invoices. An invoice must include--

(1) Name and address of the Contractor;

(2) Invoice date;

(3) Contract number, contract line item number and, if applicable, the order number;

(4) Description, quantity, unit of measure, unit price and extended price of the items delivered;

(5) Shipping number and date of shipment including the bill of lading number and weight of shipment if shipped on Government bill of lading;

(6) Terms of any prompt payment discount offered;

(7) Name and address of official to whom payment is to be sent; and

(8) Name, title, and phone number of person to be notified in event of defective invoice.

Invoices will be handled in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) Circular A-125, Prompt Payment. Contractors are encouraged to assign an identification number to each invoice.

(h) Patent indemnity. The Contractor shall indemnify the Government and its officers, employees and agents against liability, including costs, for actual or alleged direct or contributory infringement of, or inducement to infringe, any United States or foreign patent, trademark or copyright, arising out of the performance of this contract, provided the Contractor is reasonably notified of such claims and proceedings.

(i) Payment. Payment shall be made for items accepted by the Government that have been delivered to the delivery destinations set forth in this contract. The Government will make payment in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) Circular A-125, Prompt Payment. If the Government makes payment by Electronic Funds Transfer (EFT), see 52.212-5(b) for the appropriate EFT clause. In connection with any discount offered for early payment, time shall be computed from the date of the invoice. For the purpose of computing the discount earned, payment shall be considered to have been made on the date which appears on the payment check or the specified payment date if an electronic funds transfer payment is made.

(j) Risk of loss. Unless the contract specifically provides otherwise, risk of loss or damage to the supplies provided under this contract shall remain with the Contractor until, and shall pass to the Government upon:

(1) Delivery of the supplies to a carrier, if transportation is f.o.b. origin; or

(2) Delivery of the supplies to the Government at the destination specified in the contract, if transportation is f.o.b. destination.

(k) Taxes. The contract price includes all applicable Federal, State, and local taxes and duties.

(l) Termination for the Government's convenience. The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience. In the event of such termination, the Contractor shall immediately stop all work hereunder and shall immediately cause any and all of its suppliers and subcontractors to cease work. Subject to the terms of this contract, the Contractor shall be paid a percentage of the contract price reflecting the percentage of the work performed prior to the notice of termination, plus reasonable charges the Contractor can demonstrate to the satisfaction of the Government using its standard record keeping system, have resulted from the termination. The Contractor shall not be required to comply with the cost accounting standards or contract cost principles for this purpose. This paragraph does not give the Government any right to audit the Contractor's records. The Contractor shall not be paid for any work performed or costs incurred which reasonably could have been avoided.

(m) Termination for cause. The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, and the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.

(n) Title. Unless specified elsewhere in this contract, title to items furnished under this contract shall pass to the Government upon acceptance, regardless of when or where the Government takes physical possession.

(o) Warranty. The Contractor warrants and implies that the items delivered hereunder are merchantable and fit for use for the particular purpose described in this contract.

(p) Limitation of liability. Except as otherwise provided by an express warranty, the Contractor will not be liable to the Government for consequential damages resulting from any defect or deficiencies in accepted items.

(q) Other compliances. The Contractor shall comply with all applicable Federal, State and local laws, executive orders, rules and regulations applicable to its performance under this contract.

(r) Compliance with laws unique to Government contracts. The Contractor agrees to comply with 31 U.S.C. 1352 relating to limitations on the use of appropriated funds to influence certain Federal contracts; 18 U.S.C. 431 relating to officials not to benefit; 40 U.S.C. 327, et seq., Contract Work Hours and Safety Standards Act; 41 U.S.C. 51-58, Anti-Kickback Act of 1986; 41 U.S.C. 265 and 10 U.S.C. 2409 relating to whistleblower protections; 49 U.S.C. 40118, Fly American; and 41 U.S.C. 423 relating to procurement integrity.

(s) Order of precedence. Any inconsistencies in this solicitation or contract shall be resolved by giving precedence in the following order: (1) the schedule of supplies/services; (2) the Assignments, Disputes, Payments, Invoice, Other Compliances, and Compliance with Laws Unique to Government Contracts paragraphs of this clause; (3) the clause at 52.212-5; (4) addenda to this solicitation or contract, including any license agreements for computer software; (5) solicitation provisions if this is a solicitation; (6) other paragraphs of this clause; (7) the Standard Form 1449; (8) other documents, exhibits, and attachments; and (9) the specification.

(End of clause)

52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL ITEMS (MAY 2002)

(a) The Contractor shall comply with the following FAR clauses, which are incorporated in this contract by reference, to implement provisions of law or executive orders applicable to acquisitions of commercial items:

(1) 52.222-3, Convict Labor (E.O. 11755).

(2) 52.233-3, Protest after Award (31 U.S.C. 3553).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items or components:

(Contracting Officer shall check as appropriate.)

XX (1) 52.203-6, Restrictions on Subcontractor Sales to the Government, with Alternate I (41 U.S.C. 253g and 10 U.S.C. 2402).

N/A (2) 52.219-3, Notice of HUBZone Small Business Set-Aside (Jan 1999).

XX (3) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (Jan 1999) (if the offeror elects to waive the preference, it shall so indicate in its offer).

N/A (4) (i) 52.219-5, Very Small Business Set-Aside (Pub. L. 103-403, section 304, Small Business Reauthorization and Amendments Act of 1994).

____ (ii) Alternate I to 52.219-5.

____ (iii) Alternate II to 52.219-5.

XX (5) 52.219-8, Utilization of Small Business Concerns (15 U.S.C. 637 (d)(2) and (3)).

XX (6) 52.219-9, Alt I, Small Business Subcontracting Plan (15 U.S.C. 637 (d)(4)).

N/A (7) 52.219-14, Limitations on Subcontracting (15 U.S.C. 637(a)(14)).

N/A (8)(i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Concerns (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323) (if the offeror elects to waive the adjustment, it shall so indicate in its offer.

____(ii) Alternate I of 52.219-23.

N/A (9) 52.219-25, Small Disadvantaged Business Participation Program--Disadvantaged Status and Reporting (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

N/A (10) 52.219-26, Small Disadvantaged Business Participation Program--Incentive Subcontracting (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

XX (11) 52.222-21, Prohibition of Segregated Facilities (Feb 1999).

XX (12) 52.222-26, Equal Opportunity (E.O. 11246).

XX (13) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era and Other Eligible Veterans (38 U.S.C. 4212).

XX (14) 52.222-36, Affirmative Action for Workers with Disabilities (29 U.S.C. 793).

XX (15) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era and Other Eligible Veterans (38 U.S.C. 4212).

XX (16) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (E.O. 13126).

N/A (17)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (42 U.S.C. 6962(c)(3)(A)(ii)).

____(ii) Alternate I of 52.223-9 (42 U.S.C. 6962(i)(2)(C)).

N/A (18) 52.225-1, Buy American Act--Supplies (41 U.S.C. 10a-10d).

N/A (19)(i) 52.225-3, Buy American Act--North American Free Trade Agreement--Israeli Trade Act (41 U.S.C. 10a-10d, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note).

____(ii) Alternate I of 52.225-3.

____(iii) Alternate II of 52.225-3.

N/A (20) 52.225-5, Trade Agreements (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).

XX (21) 52.225-13, Restriction on Certain Foreign Purchases (E.O. 12722, 12724, 13059, 13067, 13121, and 13129).

N/A (22) 52.225-15, Sanctioned European Union Country End Products (E.O. 12849).

N/A (23) 52.225-16, Sanctioned European Union Country Services (E.O.12849).

XX (24) 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration (31 U.S.C. 3332).

N/A (25) 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration (31 U.S.C. 3332).

N/A (26) 52.232-36, Payment by Third Party (31 U.S.C. 3332).

N/A (27) 52.239-1, Privacy or Security Safeguards (5 U.S.C. 552a).

XX (28) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (46 U.S.C. 1241).

____ Alternate I of 52.247-64.

(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, which the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or executive orders applicable to acquisitions of commercial items or components:

(Contracting Officer check as appropriate.)

____ (1) 52.222-41, Service Contract Act of 1965, As amended (41 U.S.C. 351, et. seq.).

____ (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (29 U.S.C. 206 and 41 U.S.C. 351, et. seq.).

____ (3) 52.222-43, Fair Labor Standards Act and Service Contract Act -- Price Adjustment (Multiple Year and Option Contracts) (29 U.S.C.206 and 41 U.S.C. 351, et seq.).

____ (4) 52.222-44, Fair Labor Standards Act and Service Contract Act - Price Adjustment (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

____ (5) 52.222-47, SCA Minimum Wages and Fringe Benefits Applicable to Successor Contract Pursuant to Predecessor Contractor Collective Bargaining Agreement (CBA) (41 U.S.C. 351, et seq.).

(d) Comptroller General Examination of Record. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records--Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c) or (d) of this clause, the Contractor is not required to include any FAR clause, other than those listed below (and as may be required by an addenda to this paragraph to establish the reasonableness of prices under Part 15), in a subcontract for commercial items or commercial components--

(1) 52.222-26, Equal Opportunity (E.O. 11246);

(2) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era and Other Eligible Veterans (38 U.S.C. 4212);

(3) 52.222-36, Affirmative Action for Workers with Disabilities (29 U.S.C. 793);

(4) 52.247-64, Preference for Privately-Owned U.S.- Flag Commercial Vessels (46 U.S.C. 1241)(flow down not required for subcontracts awarded beginning May 1, 1996)., and

(5) 52.222-41, Service Contract Act of 1965, As Amended (41 U.S.C. 351, et seq.).

(End of clause)

52.214-21 DESCRIPTIVE LITERATURE (APR 2002)

(a) Descriptive literature, as used in this provision, means information furnished by a bidder, such as cuts, illustrations, drawings, and brochures, that shows a product's characteristics or construction or explains its operation. The term includes only that information required to evaluate the acceptability of the product and excludes other information for operating or maintaining the product.

(b) Descriptive literature is required to establish, for the purpose of evaluation and award, details of the product offered that are specified elsewhere in the solicitation and pertain to significant elements such as--

(1) Design;

(2) Materials;

(3) Components;

(4) Performance characteristics; and

(5) Methods of manufacture, assembly, construction, or operation.

(c) Descriptive literature, required elsewhere in this solicitation, shall be--

(1) Identified to show the item(s) of the offer to which it applies; and

(2) Received by the time specified in this solicitation.

(d) If the bidder fails to submit descriptive literature on time, the Government will reject the bid, except that late descriptive literature sent by mail may be considered under the Late Submissions, Modifications, and Withdrawals of Bids provision of this solicitation.

(e) If the descriptive literature fails to show that the product offered conforms to the requirements of the solicitation, the Government will reject the bid.

(End of provision)

52.214-26 AUDIT AND RECORDS--SEALED BIDDING. (OCT 1997)

(a) As used in this clause, records includes books, documents, accounting procedures and practices, and other data, regardless of type and regardless of whether such items are in written form, in the form of computer data, or in any other form.

(b) Cost or pricing data. If the Contractor has been required to submit cost or pricing data in connection with the pricing of any modification to this contract, the Contracting Officer, or an authorized representative of the Contracting Officer, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections, related to--

(1) The proposal for the modification;

(2) The discussions conducted on the proposal(s), including those related to negotiating;

(3) Pricing of the modification; or

(4) Performance of the modification.

(c) Comptroller General. In the case of pricing any modification, the Comptroller General of the United States, or an authorized representative, shall have the same rights as specified in paragraph (b) of this clause.

(d) Availability. The Contractor shall make available at its office at all reasonable times the materials described in reproduction, until 3 years after final payment under this contract, or for any other period specified in Subpart 4.7 of the Federal Acquisition Regulation (FAR). FAR Subpart 4.7, Contractor Records Retention, in effect on the date of this contract, is incorporated by reference in its entirety and made a part of this contract.

(1) If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement.

(2) Records pertaining to appeals under the Disputes clause or to litigation or the settlement of claims arising under or relating to the performance of this contract shall be made available until disposition of such appeals, litigation, or claims.

(e) The Contractor shall insert a clause containing all the provisions of this clause, including this paragraph (e), in all subcontracts expected to exceed the threshold in FAR 15.403-4(a)(1) for submission of cost or pricing data.

(End of clause)

52.214-27 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA - MODIFICATIONS - SEALED BIDDING. (OCT 1997)

(a) This clause shall become operative only for any modification to this contract involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for the submission of cost or pricing data at FAR 15.403-4(a)(1), except that this clause does not apply to a modification if an exception under FAR 15.403-1(b) applies.

(1) Based on adequate price competition;

(2) Based on established catalog or market prices of commercial items sold in substantial quantities to the general public; or

(3) Set by law or regulation.

(b) If any price, including profit, negotiated in connection with any modification under this clause, was increased by any significant amount because

(1) the Contractor or a subcontractor furnished cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data;

(2) a subcontractor or prospective subcontractor furnished the Contractor cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data; or

(3) any of these parties furnished data of any description that were not accurate, the price shall be reduced accordingly and the contract shall be modified to reflect the reduction. This right to a price reduction is limited to that resulting from defects in data relating to modifications for which this clause becomes operative under paragraph (a) above.

(c) Any reduction in the contract price under paragraph (b) above due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which:

(1) the actual subcontract; or

(2) the actual cost to the Contractor, if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor; provided, that the actual subcontract price was not itself affected by defective cost or pricing data.

(d) If the Contracting Officer determines under paragraph (b) of this clause that a price or cost reduction should be made:

(1) the Contractor agrees not to raise the following matters as a defense:

(i) The Contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the price of the contract would not have been modified even if accurate, complete, and current cost or pricing data had been submitted;

(ii) The Contracting Officer should have known that the cost or pricing data in issue were defective even though the Contractor or subcontractor took no affirmative action to bring the character of the data to the attention of the Contracting Officer;

(iii) The contract was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under the contract; or

(iv) The Contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.

(2) Except as prohibited by subdivision (d)(2)(ii) of this clause:

(i) an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a contract price reduction if:

(A) The Contractor certifies to the Contracting Officer that, to the best of the Contractor's knowledge and belief, the Contractor is entitled to the offset in the amount requested; and

(B) The Contractor proves that the cost or pricing data were available before the date of agreement on the price of the contract (or price of the modification) and that the data were not submitted before such date.

(ii) An offset shall not be allowed if:

(A) The understated data was known by the Contractor to be understated when the Certificate of Current Cost or Pricing Data was signed; or (B) The Government proves that the facts demonstrate that the contract price would not have increased in the amount to be offset even if the available data had been submitted before the date of agreement on price.

(e) If any reduction in the contract price under this clause reduces the price of items for which payment was made prior to the date of the modification reflecting the price reduction, the Contractor shall be liable to and shall pay the United States at the time such overpayment is repaid:

(1) Simple interest on the amount of such overpayment to be computed from the date(s) of overpayment to the Contractor to the date the Government is repaid by the Contractor at the applicable underpayment rate effective for each quarter prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and

(2) A penalty equal to the amount of the overpayment, if the Contractor or subcontractor knowingly submitted cost or pricing data which were incomplete, inaccurate, or noncurrent.

(End of clause)

52.214-28 SUBCONTRACTOR COST OR PRICING DATA - MODIFICATIONS - SEALED BIDDING. (OCT 1997)

(a) The requirements of paragraphs (b) and (c) of this clause shall:

(1) become operative only for any modification to this contract involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for submission of cost or pricing data at (FAR) 48 CFR 15.403-4(a)(1); and

(2) be limited to such modifications.

(b) Before awarding any subcontract expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1), on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modifications involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1), the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless an exception under FAR 15.403-1(b) applies.

(1) Based on adequate price competition;

(2) Based on established catalog or market prices of commercial items sold in substantial quantities to the general public; or

(3) Set by law or regulation.

(c) The Contractor shall require the subcontractor to certify in substantially the form prescribed in subsection 15.406-2 of the Federal Acquisition Regulation that, to the best of its knowledge and belief, the data submitted under

paragraph (b) above were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(d) The Contractor shall insert the substance of this clause, including this paragraph (d), in each subcontract that, when entered into, exceeds the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1).

(End of clause)

52.214-34 SUBMISSION OF OFFERS IN THE ENGLISH LANGUAGE (APR 1991)

Offers submitted in response to this solicitation shall be in the English language. Offers received in other than English shall be rejected.

(End of provision)

52.214-35 SUBMISSION OF OFFERS IN U.S. CURRENCY (APR 1991)

Offers submitted in response to this solicitation shall be in terms of U.S. dollars. Offers received in other than U.S. dollars shall be rejected.

(End of provision)

52.214-5000 APPARENT CLERICAL MISTAKES (MAR 1995)--EFARS

(a) For the purpose of initial evaluations of bids, the following will be utilized in the resolving arithmetic discrepancies found on the face of bidding schedule as submitted by the bidder:

- (1) Obviously misplaced decimal points will be corrected;
- (2) Discrepancy between unit price and extended price, the unit price will govern;
- (3) Apparent errors in extension of unit prices will be corrected;
- (4) Apparent errors in addition of lump-sum and extended prices will be corrected.

(b) For the purpose of bid evaluation, the government will proceed on the assumption that the bidder intends his bid to be evaluated on basis of the unit prices, the totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.

(c) These correction procedures shall not be used to resolve any ambiguity concerning which bid is low.

(End of statement)

52.232-5001 CONTINUING CONTRACTS (MAR 1995)--EFARS

(a) This is a continuing contract, as authorized by Section 10 of the River and Harbor Act of September 22, 1922 (33 U.S. Code 621). The payment of some portion of the contract price is dependent upon reservations of funds from future appropriations, and from future contribution to the project having one or more non-federal project sponsors. The responsibilities of the Government are limited by this clause notwithstanding any contrary provision of the "Payments to Contractor" clause or any other clause of this contract.

(b) The sum of \$1,000.00 has been reserved for this contract and is available for payments to the contractor during the current fiscal year. It is expected that Congress will make appropriations for future fiscal years from which additional funds together with funds provided by one or more non-federal project sponsors will be reserved for this contract.

(c) Failure to make payments in excess of the amount currently reserved, or that may be reserved from time to time, shall not entitle the contractor to a price adjustment under the terms of this contract except as specifically provided in

paragraphs (f) and (i) below. No such failure shall constitute a breach of this contract, except that this provision shall not bar a breach-of-contract action if an amount finally determined to be due as a termination allowance remains unpaid for one year due solely to a failure to reserve sufficient additional funds therefore.

(d) The Government may at any time reserve additional funds for payments under the contract if there are funds available for such purpose. The contracting officer will promptly notify the contractor of any additional funds reserved for the contract by issuing an administrative modification to the contract.

(e) If earnings will be such that funds reserved for the contract will be exhausted before the end of any fiscal year, the contractor shall give written notice to the contracting officer of the estimated date of exhaustion and the amount of additional funds which will be needed to meet payments due or to become due under the contract during that fiscal year. This notice shall be given not less than 45 nor more than 60 days prior to the estimated date of exhaustion.

(f) No payments will be made after exhaustion of funds except to the extent that additional funds are reserved for the contract. The contractor shall be entitled to simple interest on any payment that the contracting officer determines was actually earned under the terms of the contract and would have been made except for exhaustion of funds. Interest shall be computed from the time such payment would otherwise have been made until actually or constructively made, and shall be at the rate established by the Secretary of the Treasury pursuant to Public Law 92-41, 85 STAT 97, as in effect on the first day of the delay in such payment.

(g) Any suspension, delay, or interruption of work arising from exhaustion or anticipated exhaustion of funds shall not constitute a breach of this contract and shall not entitle the contractor to any price adjustment under the "Suspension of Work" clause or in any other manner under this contract.

(h) An equitable adjustment in performance time shall be made for any increase in the time required for performance of any part of the work arising from exhaustion of funds or the reasonable anticipation of exhaustion of funds.

(i) If, upon the expiration of sixty (60) days after the beginning of the fiscal year following an exhaustion of funds, the Government has failed to reserve sufficient additional funds to cover payments otherwise due, the contractor, by written notice delivered to the contracting officer at any time before such additional funds are reserved, may elect to treat his right to proceed with the work as having been terminated. Such a termination shall be considered a termination for the convenience of the Government.

(j) If at any time it becomes apparent that the funds reserved for any fiscal year are in excess of the funds required to meet all payments due or to become due the contractor because of work performed and to be performed under the contract during the fiscal year, the Government reserves the right, after notice to the contractor, to reduce said reservation by the amount of such excess.

(End of clause)

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a Firm Fixed Price contract resulting from this solicitation.

(End of clause)

52.237-1 SITE VISIT (APR 1984)

(a) Offerors or quoters are urged and expected to inspect the site where services are to be performed and to satisfy themselves regarding all general and local conditions that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to inspect the site constitute grounds for a claim after contract award.

(End of clause)

52.247-34 F.O.B. DESTINATION (NOV 1991)

(a) The term "f.o.b. destination," as used in this clause, means--

(1) Free of expense to the Government, on board the carrier's conveyance, at a specified delivery point where the consignee's facility (plant, warehouse, store, lot, or other location to which shipment can be made) is located; and

(2) Supplies shall be delivered to the destination consignee's wharf (if destination is a port city and supplies are for export), warehouse unloading platform, or receiving dock, at the expense of the Contractor. The Government shall not be liable for any delivery, storage, demurrage, accessorial, or other charges involved before the actual delivery (or "constructive placement" as defined in carrier tariffs) of the supplies to the destination, unless such charges are caused by an act or order of the Government acting in its contractual capacity. If rail carrier is used, supplies shall be delivered to the specified unloading platform of the consignee. If motor carrier (including "piggyback") is used, supplies shall be delivered to truck tailgate at the unloading platform of the consignee, except when the supplies delivered meet the requirements of Item 568 of the National Motor Freight Classification for "heavy or bulky freight." When supplies meeting the requirements of the referenced Item 568 are delivered, unloading (including movement to the tailgate) shall be performed by the consignee, with assistance from the truck driver, if requested. If the contractor uses rail carrier or freight forwarded for less than carload shipments, the contractor shall ensure that the carrier will furnish tailgate delivery, when required, if transfer to truck is required to complete delivery to consignee.

(b) The Contractor shall--

(1)(i) Pack and mark the shipment to comply with contract specifications; or

(ii) In the absence of specifications, prepare the shipment in conformance with carrier requirements;

(2) Prepare and distribute commercial bills of lading;

(3) Deliver the shipment in good order and condition to the point of delivery specified in the contract;

(4) Be responsible for any loss of and/or damage to the goods occurring before receipt of the shipment by the consignee at the delivery point specified in the contract;

(5) Furnish a delivery schedule and designate the mode of delivering carrier; and

(6) Pay and bear all charges to the specified point of delivery.

(End of clause)

252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)

(a) "Definition. Contracting officer's representative" means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the contracting officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a contracting officer's representative (COR), the Contractor will receive a copy of the written designation. It will specify the extent of the COR's authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

(End of clause)

252.212-7001 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS APPLICABLE TO DEFENSE ACQUISITIONS OF COMMERCIAL ITEMS (MAY 2002)

(a) The Contractor agrees to comply with the following Federal Acquisition Regulation (FAR) clause which, if checked, is included in this contract by reference to implement a provision of law applicable to acquisitions of commercial items or components.

XX 52.203-3 Gratuities (APR 1984) (10 U.S.C. 2207).

(b) The Contractor agrees to comply with any clause that is checked on the following list of Defense FAR Supplement clauses which, if checked, is included in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items or components.

XX 252.205-7000 Provision of Information to Cooperative Agreement Holders (DEC 1991) (10 U.S.C. 2416).

N/A 252.206-7000 Domestic Source Restriction (DEC 1991) (10 U.S.C. 2304)

XX 252.219-7003 Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (DoD Contracts) (APR 1996) (15 U.S.C. 637).

N/A 252.219-7004 Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (Test Program) (JUN 1997) (15 U.S.C. 637 note).

N/A 252.225-7001 Buy American Act and Balance of Payment Program (MAR 1998) (41 U.S.C. 10a-10d, E.O. 10582).

XX 252.225-7007 Buy American Act--Trade Agreements--Balance of Payments Program (SEP 2001) (41 U.S.C. 10a-10d, 19 U.S.C. 2501-2518, and 19 U.S.C. 3301 note).

XX 252.225-7012 Preference for Certain Domestic Commodities (APR 2002) (10 U.S.C. 2533a).

N/A 252.225-7014 Preference for Domestic Specialty Metals (MAR 1998) (10 U.S.C. 2533a).

XX 252.225-7015 Preference for Domestic Hand or Measuring Tools (DEC 1991) (10 U.S.C. 2533a).

N/A 252.225-7016 Restriction on Acquisition of Ball and Roller Bearings (DEC 2000) (____Alternate I) (DEC 2000) (Section 8064 of Pub. L. 106-259).

N/A 252.225-7021 Trade Agreements (SEP 2001) (19 U.S.C. 2501-2518 and 19 U.S.C. 3301 note).

N/A 252.225-7027 Restriction on Contingent Fees for Foreign Military Sales (MAR 1998) (22 U.S.C. 2779).

N/A 252.225-7028 Exclusionary Policies and Practices of Foreign Governments (DEC 1991) (22 U.S.C. 2755).

N/A 252.225-7029 Preference for United States or Canadian Air Circuit Breakers (AUG 1998) (10 U.S.C. 2534(a)(3)).

N/A 252.225-7036 Buy American Act--North American Free Trade Agreement Implementation Act--Balance of Payment Program (MAR 1998) (____ Alternate I) (SEP 1999) (41 U.S.C. 10a-10d and 19 U.S.C. 3301 note).

N/A 252.227-7015 Technical Data--Commercial Items (NOV 1995) (10 U.S.C. 2320).

N/A 252.227-7037 Validation of Restrictive Markings on Technical Data (SEP 1999) (10 U.S.C. 2321).

XX 252.243-7002 Certification of Requests for Equitable Adjustment (MAR 1998) (10 U.S.C. 2410).

XX 252.247-7023 Transportation of Supplies by Sea (MAY 2002) (____ Alternate I) (MAR 2000) (____ Alternate II) (MAR 2000) Alternate III) (MAY 2002) (10 U.S.C. 2631).

XX 252.247-7024 Notification of Transportation of Supplies by Sea (MAR 2000) (10 U.S.C. 2631).

(c) In addition to the clauses listed in paragraph (e) of the Contract Terms and Conditions Required to Implement Statutes or Executive Orders--Commercial Items clause of this contract (Federal Acquisition Regulation 52.212-5), the Contractor shall include the terms of the following clauses, if applicable, in subcontracts for commercial items or commercial components, awarded at any tier under this contract:

252.225-7014 Preference for Domestic Specialty Metals, Alternate I (MAR 1998) (10 U.S.C. 2533a).

252.247-7023 Transportation of Supplies by Sea (10 U.S.C. 2631). 252.247-7024 Notification of Transportation of Supplies by Sea (MAR 2000) (10 U.S.C. 2631).

252.247-7024 Notification of Transportation of Supplies by Sea (MAR 2000) (10 U.S.C. 2631)

(End of clause)

252.225-7002 QUALIFYING COUNTRY SOURCES AS SUBCONTRACTORS (DEC 1991)

Subject to the restrictions in section 225.872 of the Defense FAR Supplement, the Contractor shall not preclude qualifying country sources and U.S. sources from competing for subcontracts under this contract.

(End of clause)

252.225-7006 BUY AMERICAN ACT--TRADE AGREEMENTS--BALANCE OF PAYMENTS PROGRAM CERTIFICATE (MAR 1998)

a) Definitions. Caribbean Basin country end product, designated country end product, domestic end product NAFTA country end product, nondesignated country end product, qualifying country end product, and U.S. made end product have the meanings given in the Buy American Act--Trade Agreements--Balance of Payments Program clause of this solicitation.

(b) Evaluation. Offers will be evaluated in accordance with the policies and procedures of Part 225 of the Defense Federal Acquisition Regulation Supplement. Offers of foreign end products that are not U.S. made, qualifying country, designated country, Caribbean Basin country, or NAFTA country end products will not be considered for award, unless the Contracting Officer determines that there are no offers of such end products; or the offers of such end products are insufficient to fulfill the requirements; or a national interest exception to the Trade Agreements Act is granted.

(c) Certifications.

(1) The Offeror certifies that—

(i) Each end product, except the end products listed in paragraph (c)(2) of this provision, is a domestic end product;
and

(ii) Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

(2) The Offeror must identify all end products that are not domestic end products.

(i) The Offeror certifies that the following supplies qualify as “U.S. made end products” but do not meet the definition of “domestic end product”:

(insert line item number)

(ii) The Offeror certifies that the following supplies are qualifying country end products:

(insert line item number)

(insert country of origin)

(iii) The Offeror certifies that the following supplies qualify as designated country end products:

(insert line item number)

(insert country of origin)

(iv) The Offeror certifies that the following supplies qualify as Caribbean Basin country end products:

(insert line item number)

(insert country of origin)

(v) The Offeror certifies that the following supplies qualify as NAFTA country end products:

(insert line item number)

(insert country of origin)

(vi) The following supplies are other nondesignated country end products.

Insert line item number Insert country of origin

(End of clause)

252.225-7037 DUTY-FREE ENTRY--ELIGIBLE END PRODUCTS (AUG 2000)

(a) Definition. Eligible end product, as used in this clause, means--

(1) Designated country end product, Caribbean Basin country end product, or NAFTA country end product, as defined in the Trade Agreements clause of this contract;

(2) NAFTA country end product, as defined in the Buy American Act--North American Free Trade Agreement Implementation Act--Balance of Payments Program clause of this contract; or

(3) Canadian end product, as defined in Alternate I of the Buy American Act--North American Free Trade Agreement Implementation Act--Balance of Payments Program clause of this contract.

(b) The requirements of this clause apply to this contract and subcontracts, including purchase orders, that involve delivery of eligible end products to be accorded duty-free entry whether placed--

(1) Directly with a foreign concern as a prime contract; or

(2) As a subcontract or purchase order under a contract with a domestic concern.

(c) Except as otherwise approved by the Contracting Officer, no amount is or will be included in the contract price for duty for eligible end products.

(d) The Contractor warrants that--

(1) All eligible end products, for which duty-free entry is to be claimed under this clause, are intended to be delivered to the Government; and

(2) The Contractor will pay any applicable duty to the extent that such eligible end products, or any portion thereof (if not scrap or salvage) are diverted to nongovernmental use, other than as a result of a competitive sale made, directed, or authorized by the Contracting Officer.

(e) The Government agrees to execute duty-free certificates and to afford such assistance as appropriate to obtain the duty-free entry of eligible end products for which the shipping documents bear the notation specified in paragraph (f) of this clause, except as the Contractor may otherwise agree. (f) All shipping documents submitted to Customs, covering eligible end products for which duty-free entry certificates are to be issued under this clause, shall--

(1) Consign the shipments to the appropriate--

(i) Military department in care of the Contractor, including the Contractor's delivery address; or

(ii) Military installation; and

(2) Include the following information--

(i) Prime contract number, and delivery order if applicable;

(ii) Number of the subcontract/purchase order for foreign supplies if applicable;

(iii) Identification of carrier;

(iv)(A) For direct shipments to a U.S. military installation, the notation: UNITED STATES GOVERNMENT, DEPARTMENT OF DEFENSE Duty-Free Entry to be claimed pursuant to Section XXII, Chapter 98, Subchapter VIII, Item 9808.00.30 of the Harmonized Tariff Schedule of the United States. Upon arrival of shipment at the appropriate port of entry, District Director of Customs, please release shipment under 19 CFR part 142, and notify Commander, Defense Contract Management (DCM) New York, ATTN: Customs Team, DCMDN-GNIC, 207 New York Avenue, Building 120, Staten Island, New York 10305-5013, for execution of Customs Forms 7501, 7501A, or 7506 and any required duty-free entry certificates.

(B) In cases where the shipment will be consigned to other than a military installation, e.g., a domestic contractor's plant, the shipping document notation shall be altered to insert the name and address of the contractor, agent or broker who will notify Commander, DCM, New York, for execution of the duty-free certificate. (Note: In those instances where the shipment will be consigned to a contractor's plant and no duty-free entry certificate is required, the contractor or its agent shall claim duty-free entry under NAFTA or other trade agreement and shall comply with the U.S. Customs Service requirements. No notification to Commander, CDM, New York, is required.

(v) Gross weight in pounds (if freight is based on space tonnage, state cubic feet in addition to gross shipping weight);

(vi) Estimated value in U.S. dollars; and

(vii) Activity Address Number of the contract administration office actually administering the prime contract, e.g., for DCM Dayton, S3605A.

(g) Preparation of customs forms. (1) Except for shipments consigned to a military installation, the Contractor shall prepare, or authorize an agent to prepare, any customs forms required for the entry of eligible end products in connection with DoD contracts into the United States, its possessions, or Puerto Rico. The completed customs forms shall be submitted to the District Director of Customs with a copy to DCM New York for execution of any required duty-free entry certificates. Shipments consigned directly to a military installation will be released in accordance with 10.101 and 10.102 of the U.S. Customs regulations.

(2) For shipments containing both supplies that are to be accorded duty-free entry and supplies that are not, the Contractor shall identify on the customs forms those items that are eligible for duty-free entry.

(h) The Contractor agrees--

(1) To prepare (if this contract is placed directly with a foreign supplier), or to instruct the foreign supplier to prepare, a sufficient number of copies, of the bill of lading (or other shipping document) so that at least two of the copies accompanying the shipment will be available for use by the District Director of Customs at the port of entry;

(2) To consign the shipment as specified in paragraph (f) of this clause; and

(3) To mark the exterior of all packages as follows:

(i) "UNITED STATES GOVERNMENT, DEPARTMENT OF DEFENSE;" and

(ii) The activity address number of the contract administration office actually administering the prime contract.

(i) The Contractor agrees to notify the Contracting Officer administering the prime contract in writing of any purchase under the contract of eligible end products to be accorded duty-free entry that are to be imported into the United States for delivery to the Government or for incorporation in end items to be delivered to the Government. The notice shall be furnished to the contract administration office immediately upon award to the supplier of the eligible end products. The notice shall contain--

- (1) Prime contractor's name, address, and CAGE code;
- (2) Prime contract number, and delivery order number if applicable;
- (3) Total dollar value of the prime contract or delivery order;
- (4) Expiration date of the prime contract or delivery order;
- (5) Foreign supplier's name and address;
- (6) Number of the subcontract/purchase order for eligible end products;
- (7) Total dollar value of the subcontract for eligible end products;
- (8) Expiration date of the subcontract for eligible end products;
- (9) List of items purchased;
- (10) An agreement by the Contractor that any applicable duty shall be paid by the Contractor to the extent that such eligible end products are diverted to nongovernmental use other than as a result of a competitive sale made, directed, or authorized by the Contracting Officer; and
- (11) The scheduled delivery date(s).

(End of clause)

52.212-1 INSTRUCTIONS TO OFFERORS--COMMERCIAL ITEMS (OCT 2000)

(a) North American Industry Classification System (NAICS) code and small business size standard. The NAICS code and small business size standard for this acquisition appear in Block 10 of the solicitation cover sheet (SF 1449). However, the small business size standard for a concern which submits an offer in its own name, but which proposes to furnish an item which it did not itself manufacture, is 500 employees.

(b) Submission of offers. Submit signed and dated offers to the office specified in this solicitation at or before the exact time specified in this solicitation. Offers may be submitted on the SF 1449, letterhead stationery, or as otherwise specified in the solicitation. As a minimum, offers must show--

- (1) The solicitation number;
- (2) The time specified in the solicitation for receipt of offers;
- (3) The name, address, and telephone number of the offeror;
- (4) A technical description of the items being offered in sufficient detail to evaluate compliance with the requirements in the solicitation. This may include product literature, or other documents, if necessary;
- (5) Terms of any express warranty;

- (6) Price and any discount terms;
 - (7) "Remit to" address, if different than mailing address;
 - (8) A completed copy of the representations and certifications at FAR 52.212-3;
 - (9) Acknowledgment of Solicitation Amendments;
 - (10) Past performance information, when included as an evaluation factor, to include recent and relevant contracts for the same or similar items and other references (including contract numbers, points of contact with telephone numbers and other relevant information); and
 - (11) If the offer is not submitted on the SF 1449, include a statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation. Offers that fail to furnish required representations or information, or reject the terms and conditions of the solicitation may be excluded from consideration.
- (c) Period for acceptance of offers. The offeror agrees to hold the prices in its offer firm for 30 calendar days from the date specified for receipt of offers, unless another time period is specified in an addendum to the solicitation.
- (d) Product samples. When required by the solicitation, product samples shall be submitted at or prior to the time specified for receipt of offers. Unless otherwise specified in this solicitation, these samples shall be submitted at no expense to the Government, and returned at the sender's request and expense, unless they are destroyed during preaward testing.
- (e) Multiple offers. Offerors are encouraged to submit multiple offers presenting alternative terms and conditions or commercial items for satisfying the requirements of this solicitation. Each offer submitted will be evaluated separately.
- (f) Late submissions, modifications, revisions, and withdrawals of offers:
- (1) Offerors are responsible for submitting offers, and any modifications, revisions, or withdrawals, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that offers or revisions are due.
 - (2)(i) Any offer, modification, revision, or withdrawal of an offer received at the Government office designated in the solicitation after the exact time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and--
- (A) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of offers; or
- (B) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or
- (C) If this solicitation is a request for proposals, it was the only proposal received.
- (ii) However, a late modification of an otherwise successful offer, that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(3) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the offer wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(4) If an emergency or unanticipated event interrupts normal Government processes so that offers cannot be received at the Government office designated for receipt of offers by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation or other notice of an extension of the closing date, the time specified for receipt of offers will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(5) Offers may be withdrawn by written notice received at any time before the exact time set for receipt of offers. Oral offers in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile offers, offers may be withdrawn via facsimile received at any time before the exact time set for receipt of offers, subject to the conditions specified in the solicitation concerning facsimile offers. An offer may be withdrawn in person by an offeror or its authorized representative if, before the exact time set for receipt of offers, the identity of the person requesting withdrawal is established and the person signs a receipt for the offer.

(g) Contract award (not applicable to Invitation for Bids). The Government intends to evaluate offers and award a contract without discussions with offerors. Therefore, the offeror's initial offer should contain the offeror's best terms from a price and technical standpoint. However, the Government reserves the right to conduct discussions if later determined by the Contracting Officer to be necessary. The Government may reject any or all offers if such action is in the public interest; accept other than the lowest offer; and waive informalities and minor irregularities in offers received.

(h) Multiple awards. The Government may accept any item or group of items of an offer, unless the offeror qualifies the offer by specific limitations. Unless otherwise provided in the Schedule, offers may not be submitted for quantities less than those specified. The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit prices offered, unless the offeror specifies otherwise in the offer.

(i) Availability of requirements documents cited in the solicitation. (1) The Index of Federal Specifications, Standards and Commercial Item Descriptions and the documents listed in it may be obtained from the General Services Administration, Federal Supply Service Bureau, Specifications Section, Suite 8100, 470 L'Enfant Plaza, SW, Washington, DC 20407 ((202) 619-8925).

(2) The DOD Index of Specifications and Standards (DODISS) and documents listed in it may be obtained from the Standardization Documents Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094 (telephone (215) 697-2569).

(i) Availability of requirements documents cited in the solicitation. (1)(i) The GSA Index of Federal Specifications, Standards and Commercial Item Descriptions, FPMR Part 101-29, and copies of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained for a fee by submitting a request to--GSA Federal Supply Service Specifications Section, Suite 8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Telephone (202) 619-8925, Facsimile (202) 619-8978.

(ii) If the General Services Administration, Department of Agriculture, or Department of Veterans Affairs issued this solicitation, a single copy of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained free of charge by submitting a request to the addressee in paragraph (i)(1)(i) of this provision. Additional copies will be issued for a fee.

(2) The DoD Index of Specifications and Standards (DoDISS) and documents listed in it may be obtained from the--Department of Defense Single Stock Point (DoDSSP), Building 4, Section D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Telephone (215) 697-2667/2179, Facsimile (215) 697-1462.

(i) Automatic distribution may be obtained on a subscription basis.

(ii) Order forms, pricing information, and customer support information may be obtained--

(A) By telephone at (215) 697-2667/2179; or

(B) Through the DoDSSP Internet site at <http://assist.daps.mil>.

(3) Nongovernment (voluntary) standards must be obtained from the organization responsible for their preparation, publication, or maintenance.

(j) Data Universal Numbering System (DUNS) Number. (Applies to offers exceeding \$25,000.) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" followed by the DUNS number that identifies the offeror's name and address. If the offeror does not have a DUNS number, it should contact Dun and Bradstreet to obtain one at no charge. An offeror within the United States may call 1-800-333-0505. The offeror may obtain more information regarding the DUNS number, including locations of local Dun and Bradstreet Information Services offices for offerors located outside the United States, from the Internet home page at <http://www.customerservice@dnb.com/>. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@mail.dnb.com.

(End of provision)

252.212-7000 OFFEROR REPRESENTATIONS AND CERTIFICATIONS- COMMERCIAL ITEMS. (NOV 1995)

(a) Definitions.

As used in this clause-

(1) Foreign person means any person other than a United States person as defined in Section 16(2) of the Export Administration Act of 1979 (50 U.S.C. App. Sec. 2415).

(2) United States person is defined in Section 16(2) of the Export Administration Act of 1979 and means any United States resident or national (other than an individual resident outside the United States and employed by other than a United States person), any domestic concern (including any permanent domestic establishment of any foreign concern), and any foreign subsidiary or affiliate (including any permanent foreign establishment) of any domestic concern which is controlled in fact by such domestic concern, as determined under regulations of the President.

(b) Certification.

By submitting this offer, the Offeror, if a foreign person, company or entity, certifies that it -

(1) Does not comply with the Secondary Arab Boycott of Israel; and

(2) Is not taking or knowingly agreeing to take any action, with respect to the Secondary Boycott of Israel by Arab countries, which 50 U.S.C. App. Sec. 2407(a) prohibits a United States person from taking.

(c) Representation of Extent of Transportation by Sea. (This representation does not apply to solicitations for the direct purchase of ocean transportation services).

(1) The Offeror shall indicate by checking the appropriate blank in paragraph (c)(2) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term "supplies" is defined in the Transportation of Supplies by Sea clause of this solicitation.

(2) Representation.

The Offeror represents that it-

___ Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

___ Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(3) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea Clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense Federal Acquisition Regulation Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

(End of clause)

252.247-7022 REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992)

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term supplies is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) Representation. The Offeror represents that it:

___ (1) Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

___ (2) Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

(End of provision)

SEALED BID ENVELOPES

The envelope containing your bid shall be plainly marked on the lower left-hand corner as follows:

Invitation for Bid Number (IFB): DACW21-02-B-0010

Date of Opening: 7 January 2003

Time of Opening: 11:00 a.m. Eastern Standard Time

Bid For: Static Frequency Converter (Static Start) System and Appurtenances

Hand-Carried Bids

(g) Hand-carried bids must be delivered to the bid opening officer in the bid opening room prior to time set for bid opening or to the Contracting Division, Procurement Branch (CESAS-CT-P), prior to the time set for bid opening.

(h) Bids delivered by commercial carriers are considered hand-carried bids. All Express Mail and commercial carrier bids shall be addressed to:

U.S. Army Engineer District, Savannah
Attn: CESAS-CT-P
100 West Oglethorpe Avenue
Savannah, Georgia 31401-3640

CLAUSES INCORPORATED BY FULL TEXT

52.212-3 OFFEROR REPRESENTATIONS AND CERTIFICATIONS--COMMERCIAL ITEMS (MAY 2002)

(a) Definitions. As used in this provision:

"Emerging small business" means a small business concern whose size is no greater than 50 percent of the numerical size standard for the NAICS code designated.

"Forced or indentured child labor" means all work or service-

(1) Exacted from any person under the age of 18 under the menace of any penalty for its nonperformance and for which the worker does not offer himself voluntarily; or

(2) Performed by any person under the age of 18 pursuant to a contract the enforcement of which can be accomplished by process of penalties.

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern" means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and size standards in this solicitation.

Veteran-owned small business concern means a small business concern--

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern" means a small business concern--

(1) That is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of its stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

"Women-owned business concern" means a concern which is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) Taxpayer Identification Number (TIN) (26 U.S.C. 6109, 31 U.S.C. 7701). (Not applicable if the offeror is required to provide this information to a central contractor registration database to be eligible for award.)

(1) All offerors must submit the information required in paragraphs (b)(3) through (b)(5) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the Internal Revenue Service (IRS).

(2) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(3) Taxpayer Identification Number (TIN).

___ TIN:-----

___ TIN has been applied for.

___ TIN is not required because:

___ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

Offeror is an agency or instrumentality of a foreign government;

___ Offeror is an agency or instrumentality of the Federal Government.

(4) Type of organization.

___ Sole proprietorship;

___ Partnership;

___ Corporate entity (not tax-exempt);

___ Corporate entity (tax-exempt);

☐ Government entity (Federal, State, or local);

☐ Foreign government;

☐ International organization per 26 CFR 1.6049-4;

☐ Other-----

(5) Common parent.

☐ Offeror is not owned or controlled by a common parent;

☐ Name and TIN of common parent:

Name-----

TIN-----

(c) Offerors must complete the following representations when the resulting contract is to be performed inside the United States, its territories or possessions, Puerto Rico, the Trust Territory of the Pacific Islands, or the District of Columbia. Check all that apply.

(1) Small business concern. The offeror represents as part of its offer that it () is, () is not a small business concern.

(2) Veteran-owned small business concern. (Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.) The offeror represents as part of its offer that it () is, () is not a veteran-owned small business concern.

(3) Service-disabled veteran-owned small business concern. (Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (c)(2) of this provision.) The offeror represents as part of its offer that it () is, () is not a service-disabled veteran-owned small business concern.

(4) Small disadvantaged business concern. (Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.) The offeror represents, for general statistical purposes, that it () is, () is not a small disadvantaged business concern as defined in 13 CFR 124.1002.

(5) Women-owned small business concern. (Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.) The offeror represents that it () is, () is not a women-owned small business concern.

Note: Complete paragraphs (c)(6) and (c)(7) only if this solicitation is expected to exceed the simplified acquisition threshold.

(6) Women-owned business concern (other than small business concern). (Complete only if the offeror is a women-owned business concern and did not represent itself as a small business concern in paragraph (c)(1) of this provision.) The offeror represents that it () is, a women-owned business concern.

(7) Tie bid priority for labor surplus area concerns. If this is an invitation for bid, small business offerors may identify the labor surplus areas in which costs to be incurred on account of manufacturing or production (by offeror or first-tier subcontractors) amount to more than 50 percent of the contract price:

(8) Small Business Size for the Small Business Competitiveness Demonstration Program and for the Targeted Industry Categories under the Small Business Competitiveness Demonstration Program. (Complete only if the offeror has represented itself to be a small business concern under the size standards for this solicitation.)

(i) (Complete only for solicitations indicated in an addendum as being set-aside for emerging small businesses in one of the four designated industry groups (DIGs).) The offeror represents as part of its offer that it () is, () is not an emerging small business.

(ii) (Complete only for solicitations indicated in an addendum as being for one of the targeted industry categories (TICs) or four designated industry groups (DIGs).) Offeror represents as follows:

(A) Offeror's number of employees for the past 12 months (check the Employees column if size standard stated in the solicitation is expressed in terms of number of employees); or

(B) Offeror's average annual gross revenue for the last 3 fiscal years (check the Average Annual Gross Number of Revenues column if size standard stated in the solicitation is expressed in terms of annual receipts).

(Check one of the following):

Average Annual

Number of Employees Gross Revenues

___ 50 or fewer ___ \$1 million or less

___ 51 - 100 ___ \$1,000,001 - \$2 million

___ 101 - 250 ___ \$2,000,001 - \$3.5 million

___ 251 - 500 ___ \$3,500,001 - \$5 million

___ 501 - 750 ___ \$5,000,001 - \$10 million

___ 751 - 1,000 ___ \$10,000,001 - \$17 million

___ Over 1,000 ___ Over \$17 million

(9) (Complete only if the solicitation contains the clause at FAR 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns or FAR 52.219-25, Small Disadvantaged Business Participation Program-Disadvantaged Status and Reporting, and the offeror desires a benefit based on its disadvantaged status.)

(i) General. The offeror represents that either--

(A) It () is, () is not certified by the Small Business Administration as a small disadvantaged business concern and identified, on the date of this representation, as a certified small disadvantaged business concern in the database maintained by the Small Business Administration (PRO-Net), and that no material change in disadvantaged ownership and control has occurred since its certification, and, where the concern is owned by one or more individuals claiming disadvantaged status, the net worth of each individual upon whom the certification is based does not exceed \$750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); or

(B) It () has, () has not submitted a completed application to the Small Business Administration or a Private Certifier to be certified as a small disadvantaged business concern in accordance with 13 CFR 124, Subpart B, and a

decision on that application is pending, and that no material change in disadvantaged ownership and control has occurred since its application was submitted.

(ii) Joint Ventures under the Price Evaluation Adjustment for Small Disadvantaged Business Concerns. The offeror represents, as part of its offer, that it is a joint venture that complies with the requirements in 13 CFR 124.1002(f) and that the representation in paragraph (c)(9)(i) of this provision is accurate for the small disadvantaged business concern that is participating in the joint venture. (The offeror shall enter the name of the small disadvantaged business concern that is participating in the joint venture: _____.)

(10) HUBZone small business concern. (Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.) The offeror represents, as part of its offer, that--

(i) It () is, () is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal place of ownership, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It () is, () is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (c)(10)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating on the joint venture. (The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture: _____.) Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(d) Representations required to implement provisions of Executive Order 11246--

(1) Previous Contracts and Compliance. The offeror represents that--

(i) It () has, () has not, participated in a previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation; and

(ii) It () has, () has not, filed all required compliance reports.

(2) Affirmative Action Compliance. The offeror represents that--

(i) It () has developed and has on file, () has not developed and does not have on file, at each establishment, affirmative action programs required by rules and regulations of the Secretary of Labor (41 CFR Subparts 60-1 and 60-2), or

(ii) It () has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

(e) Certification Regarding Payments to Influence Federal Transactions (31 U.S.C. 1352). (Applies only if the contract is expected to exceed \$100,000.) By submission of its offer, the offeror certifies to the best of its knowledge and belief that no Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress or an employee of a Member of Congress on his or her behalf in connection with the award of any resultant contract.

(f) Buy American Act Certificate. (Applies only if the clause at Federal Acquisition Regulation (FAR) 52.225-1, Buy American Act--Supplies, is included in this solicitation.)

(1) The offeror certifies that each end product, except those listed in paragraph (f)(2) of this provision, is a domestic end product as defined in the clause of this solicitation entitled "Buy American Act--Balance of Payments Program--Supplies" and that the offeror has considered components of unknown origin to have been mined, produced, or

manufactured outside the United States. The offeror shall list as foreign end products those end products manufactured in the United States that do not qualify as domestic end products.

(2) Foreign End Products:

Line Item No.:-----

Country of Origin:-----

(List as necessary)

(3) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25.

(g)(1) Buy American Act--North American Free Trade Agreement--Israeli Trade Act Certificate. (Applies only if the clause at FAR 52.225-3, Buy American Act--North American Free Trade Agreement--Israeli Trade Act, is included in this solicitation.)

(i) The offeror certifies that each end product, except those listed in paragraph (g)(1)(ii) or (g)(1)(iii) of this provision, is a domestic end product as defined in the clause of this solicitation entitled "Buy American Act--North American Free Trade Agreement--Israeli Trade Act" and that the offeror has considered components of unknown origin to have been mined, produced, or manufactured outside the United States.

(ii) The offeror certifies that the following supplies are NAFTA country end products or Israeli end products as defined in the clause of this solicitation entitled "Buy American Act--North American Free Trade Agreement--Israeli Trade Act":

NAFTA Country or Israeli End Products

Line Item No.:-----

Country of Origin:-----

(List as necessary)

(iii) The offeror shall list those supplies that are foreign end products (other than those listed in paragraph (g)(1)(ii) of this provision) as defined in the clause of this solicitation entitled "Buy American Act--North American Free Trade Agreement--Israeli Trade Act." The offeror shall list as other foreign end products those end products manufactured in the United States that do not qualify as domestic end products.

Other Foreign End Products

Line Item No.:-----

Country of Origin:-----

(List as necessary)

(iv) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25.

(2) (2) Buy American Act--North American Free Trade Agreements--Israeli Trade Act Certificate, Alternate I (May 2002). If Alternate I to the clause at FAR 52.225-3 is included in this solicitation, substitute the following paragraph (g)(1)(ii) for paragraph (g)(1)(ii) of the basic provision:

(g)(1)(ii) The offeror certifies that the following supplies are Canadian end products as defined in the clause of this solicitation entitled "Buy American Act--North American Free Trade Agreement--Israeli Trade Act":

Canadian End Products:

Line Item No.

(List as necessary)

(3) Buy American Act--North American Free Trade Agreements--Israeli Trade Act Certificate, Alternate II (May 2002). If Alternate II to the clause at FAR 52.225-3 is included in this solicitation, substitute the following paragraph (g)(1)(ii) for paragraph (g)(1)(ii) of the basic provision:

(g)(1)(ii) The offeror certifies that the following supplies are Canadian end products or Israeli end products as defined in the clause of this solicitation entitled "Buy American Act--North American Free Trade Agreement--Israeli Trade Act":

Canadian or Israeli End Products:

Line Item No.

Country of Origin

(List as necessary)

(4) Trade Agreements Certificate. (Applies only if the clause at FAR 52.225-5, Trade Agreements, is included in this solicitation.)

(i) The offeror certifies that each end product, except those listed in paragraph (g)(4)(ii) of this provision, is a U.S.-made, designated country, Caribbean Basin country, or NAFTA country end product, as defined in the clause of this solicitation entitled "Trade Agreements."

(ii) The offeror shall list as other end products those end products that are not U.S.-made, designated country, Caribbean Basin country, or NAFTA country end products.

Other End Products

Line Item No.:-----

Country of Origin:-----

(List as necessary)

(iii) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25. For line items subject to the Trade Agreements Act, the Government will evaluate offers of U.S.-made, designated country, Caribbean Basin country, or NAFTA country end products without regard to the restrictions of the Buy American Act. The Government will consider for award only offers of U.S.-made, designated country, Caribbean Basin country, or NAFTA country end products unless the Contracting Officer determines that there are no offers for such products or that the offers for such products are insufficient to fulfill the requirements of the solicitation.

(h) Certification Regarding Debarment, Suspension or Ineligibility for Award (Executive Order 12549). (Applies only if the contract value is expected to exceed the simplified acquisition threshold.) The offeror certifies, to the best of its knowledge and belief, that the offeror and/or any of its principals--

(1) ☐ Are, ☐ are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency; and

(2) ☐ Have, ☐ have not, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: Commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a Federal, state or local government contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or Commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(3) ☐ Are, ☐ are not presently indicted for, or otherwise criminally or civilly charged by a Government entity with, commission of any of these offenses.

(i) Certification Regarding Knowledge of Child Labor for Listed End Products (Executive Order 13126). [The Contracting Officer must list in paragraph (i)(1) any end products being acquired under this solicitation that are included in the List of Products Requiring Contractor Certification as to Forced or Indentured Child Labor, unless excluded at 22.1503(b).]

(1) Listed end products.

Listed End Product

Listed Countries of Origin

(2) Certification. (If the Contracting Officer has identified end products and countries of origin in paragraph (i)(1) of this provision, then the offeror must certify to either (i)(2)(i) or (i)(2)(ii) by checking the appropriate block.)

☐ (i) The offeror will not supply any end product listed in paragraph (i)(1) of this provision that was mined, produced, or manufactured in the corresponding country as listed for that product.

☐ (ii) The offeror may supply an end product listed in paragraph (i)(1) of this provision that was mined, produced, or manufactured in the corresponding country as listed for that product. The offeror certifies that it has made a good faith effort to determine whether forced or indentured child labor was used to mine, produce, or manufacture any such end product furnished under this contract. On the basis of those efforts, the offeror certifies that it is not aware of any such use of child labor.

(End of provision)

52.214-3 AMENDMENTS TO INVITATIONS FOR BIDS (DEC 1989)

(a) If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.

(b) Bidders shall acknowledge receipt of any amendment to this solicitation (1) by signing and returning the amendment, (2) by identifying the amendment number and date in the space provided for this purpose on the form for submitting a bid, (3) by letter or telegram, or (4) by facsimile, if facsimile bids are authorized in the solicitation. The Government must receive the acknowledgment by the time and at the place specified for receipt of bids.

(End of provision)

52.214-4 FALSE STATEMENTS IN BIDS (APR 1984)

Bidders must provide full, accurate, and complete information as required by this solicitation and its attachments. The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

(End of provision)

52.214-5 SUBMISSION OF BIDS (MAR 1997)

(a) Bids and bid modifications shall be submitted in sealed envelopes or packages (unless submitted by electronic means) (1) addressed to the office specified in the solicitation, and (2) showing the time and date specified for receipt, the solicitation number, and the name and address of the bidder.

(b) Bidders using commercial carrier services shall ensure that the bid is addressed and marked on the outermost envelope or wrapper as prescribed in subparagraphs (a)(1) and (2) of this provision when delivered to the office specified in the solicitation.

(c) Telegraphic bids will not be considered unless authorized by the solicitation; however, bids may be modified or withdrawn by written or telegraphic notice.

(d) Facsimile bids, modifications, or withdrawals, will not be considered unless authorized by the solicitation.

(e) Bids submitted by electronic commerce shall be considered only if the electronic commerce method was specifically stipulated or permitted by the solicitation.

(End of provision)

52.214-6 EXPLANATION TO PROSPECTIVE BIDDERS (APR 1984)

Any prospective bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must request it in writing soon enough to allow a reply to reach all prospective bidders before the submission of their bids. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective bidder concerning a solicitation will be furnished promptly to all other prospective bidders as an amendment to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders.

(End of provision)

52.214-7 LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS (NOV 1999)

(a) Bidders are responsible for submitting bids, and any modifications or withdrawals, so as to reach the Government office designated in the invitation for bids (IFB) by the time specified in the IFB. If no time is specified in the IFB, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that bids are due.

(b)(1) Any bid, modification, or withdrawal received at the Government office designated in the IFB after the exact time specified for receipt of bids is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late bid would not unduly delay the acquisition; and--

(i) If it was transmitted through an electronic commerce method authorized by the IFB, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of bids; or

(ii) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of bids and was under the Government's control prior to the time set for receipt of bids.

(2) However, a late modification of an otherwise successful bid that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(c) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the bid wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(d) If an emergency or unanticipated event interrupts normal Government processes so that bids cannot be received at the Government office designated for receipt of bids by the exact time specified in the IFB and urgent Government requirements preclude amendment of the IFB, the time specified for receipt of bids will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(e) Bids may be withdrawn by written notice received at any time before the exact time set for receipt of bids. If the IFB authorizes facsimile bids, bids may be withdrawn via facsimile received at any time before the exact time set for receipt of bids, subject to the conditions specified in the provision at 52.214-31, Facsimile Bids. A bid may be withdrawn in person by a bidder or its authorized representative if, before the exact time set for receipt of bids, the identity of the person requesting withdrawal is established and the person signs a receipt for the bid.

(End of provision)

52.214-9 FAILURE TO SUBMIT BID. (JUL 1995)

Recipients of this solicitation not responding with a bid should not return this solicitation, unless it specifies otherwise. Instead, they should advise the issuing office by letter, postcard, or established electronic commerce methods, whether they want to receive future solicitations for similar requirements.

(End of provision)

52.214-10 CONTRACT AWARD--SEALED BIDDING (JUL 1990)

(a) The Government will evaluate bids in response to this solicitation without discussions and will award a contract to the responsible bidder whose bid, conforming to the solicitation, will be most advantageous to the Government considering only price and the price-related factors specified elsewhere in the solicitation.

(b) The Government may (1) reject any or all bids, (2) accept other than the lowest bid, and (3) waive informalities

or minor irregularities in bids received.

(c) The Government may accept any item or group of items of a bid, unless the bidder qualifies the bid by specific limitations. Unless otherwise provided in the Schedule, bids may be submitted for quantities less than those specified. The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit prices offered, unless the bidder specifies otherwise in the bid.

(d) A written award or acceptance of a bid mailed or otherwise furnished to the successful bidder within the time for acceptance specified in the bid shall result in a binding contract without further action by either party.

(e) The Government may reject a bid as nonresponsive if the prices bid are materially unbalanced between line items or subline items. A bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the Government even though it may be the low evaluated bid, or if it is so unbalanced as to be tantamount to allowing an advance payment.

(End of provision)

52.214-12 PREPARATION OF BIDS (APR 1984)

(a) Bidders are expected to examine the drawings, specifications, Schedule, and all instructions. Failure to do so will be at the bidder's risk.

(b) Each bidder shall furnish the information required by the solicitation. The bidder shall sign the bid and print or type its name on the Schedule and each continuation sheet on which it makes an entry. Erasures or other changes must be initialed by the person signing the bid. Bids signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(c) For each item offered, bidders shall (1) show the unit price, including, unless otherwise specified, packaging, packing, and preservation and (2) enter the extended price for the quantity of each item offered in the "Amount" column of the Schedule. In case of discrepancy between a unit price and an extended price, the unit price will be presumed to be correct, subject, however, to correction to the same extent and in the same manner as any other mistake.

(d) Bids for supplies or services other than those specified will not be considered unless authorized by the solicitation.

(e) Bidders must state a definite time for delivery of supplies or for performance of services, unless otherwise specified in the solicitation.

(f) Time, if stated as a number of days, will include Saturdays, Sundays, and holidays.

(End of provision)

52.214-14 PLACE OF PERFORMANCE--SEALED BIDDING (APR 1985)

(a) The bidder, in the performance of any contract resulting from this solicitation, [] intends, [] does not intend [check applicable box] to use one or more plants or facilities located at a different address from the address of the bidder as indicated in this bid.

(b) If the bidder checks "intends" in paragraph (a) above, it shall insert in the spaces provided below the required information:

Place of Performance Name and Address of Owner
(Street, Address, City, and Operator of the Plant or
County, State, Zip Code) Facility if Other than Bidder

(End of provision)

52.214-15 PERIOD FOR ACCEPTANCE OF BIDS (APR 1984)

In compliance with the solicitation, the bidder agrees, if this bid is accepted within _____ calendar days (60 calendar days unless a different period is inserted by the bidder) from the date specified in the solicitation for receipt of bids, to furnish any or all items upon which prices are bid at the price set opposite each item, delivered at the designated point(s), within the time specified in the Schedule.

(End of clause)

52.214-16 MINIMUM BID ACCEPTANCE PERIOD (APR 1984)

(a) "Acceptance period," as used in this provision, means the number of calendar days available to the Government for awarding a contract from the date specified in this solicitation for receipt of bids.

(b) This provision supersedes any language pertaining to the acceptance period that may appear elsewhere in this solicitation.

(c) The Government requires a minimum acceptance period of 60 calendar days.

(d) In the space provided immediately below, bidders may specify a longer acceptance period than the Government's minimum requirement.

The bidder allows the following acceptance period: _____ calendar days.

(e) A bid allowing less than the Government's minimum acceptance period will be rejected.

(f) The bidder agrees to execute all that it has undertaken to do, in compliance with its bid, if that bid is accepted in writing within (1) the acceptance period stated in paragraph (c) above or (2) any longer acceptance period stated in paragraph (d) above.

(End of clause)

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a Firm Fixed Price contract resulting from this solicitation.

(End of clause)

52.233-2 SERVICE OF PROTEST (AUG 1996)

(i) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from the Procurement Branch, CESAS-CT-P, 100 W. Oglethorpe Avenue, Savannah, Georgia 31401-3640.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

52.247-6 FINANCIAL STATEMENT (APR 1984)

The offeror shall, upon request, promptly furnish the Government with a current certified statement of the offeror's financial condition and such data as the Government may request with respect to the offeror's operations. The Government will use this information to determine the offeror's financial responsibility and ability to perform under the contract. Failure of an offeror to comply with a request for information will subject the offer to possible rejection on responsibility grounds.

(End of provision)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>

<http://www.dtic.mil/dfars>

<http://farsite.hill.af.mil>

(End of provision)

52.209-4002 PAST PERFORMANCE

In accordance with Federal Acquisition Regulation (FAR) 9.103, an affirmative determination of a contractor's responsibility is required prior to award. Therefore, bidders shall submit the following information to aid in the determination of responsibility:

- (a) A list of a minimum of three to a maximum of five contracts for similar size and scope of work, with monetary value, percentage of completion, names, address and telephone number of individual that we may contact for verification.
- (2) A bank reference, with point of contact and telephone number for verification in accordance with FAR 52.247-6.